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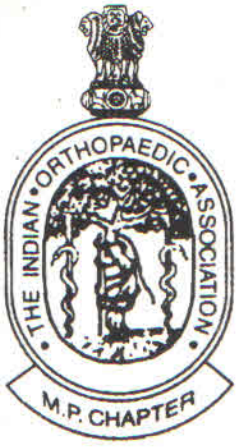

ORTHOPAEDIC JOURNAL OF M.P. CHAPTER

AN OFFICIAL PUBLICATION OF THE INDIAN ORTHOPAEDIC ASSOCIATION, M.P. CHAPTER

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M.P. CHAPTER

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EDITORIAL OFFICE

DEPT. OF ORTHOPAEDICS, MGM MEDICAL COLLEGE,
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M.P. ORTHOCON 2008

3RD, 4TH, 5TH OCTOBER

INVITATION

Dear Friends,

Indore is eagerly waiting to welcome you all to MPORTHOCON 2008. Our team is making arduous effort to make this event a real mega academic event. The scientific programme is exhaustive, crowned with jewels of orthopaedics of national and international repute. Preconference workshops will update the delegates so as to fill them with latest knowledge and technical knowhow. Registrations are pouring in. Our special efforts are to make orthopaedic surgeons from peripheries to get well acquainted with modern and current techniques in orthopaedics. Our motto is "Enhancing standards of orthopaedics".

As Indore is considered to be one of the most exotic place to visit with family for pleasure and shopping, special programme is being organised for spouse and children, so come all.

Friends, we all welcome you along with your family to the city of Indore, that never sleeps, for making this magnificent event a real grand success.

With warm regards,

Cordially yours,

Dr. (Prof.) Pradip Bhargava
Organizing Chairman

Dr. Alok Verma
Organizing Secretary

Dr. S.K. Lunawat
Co-organizing Chairman

MPORTHOCON 2008

Provisional programme : Friday, 3rd October

Preconference workshop

1.) Total knee Arthroplasty

Venue	:	M.Y. Hospital,Indore
Faculty	:	Dr. K.H. Sancheti, Pune
		Dr. Ashok Rajgopal, Fortis Hospital, New Delhi
		Dr. C. J Thakkar, Mumbai
Convener	:	Dr. S.K Lunawat , Indore
9:00 A.M - 11:30 A.M	:	Theoretical Background
11:30 A.M - 1:45 P.M	:	Live Surgical Demonstration
1:45 P.M - 2:30 P.M	:	Lunch
2:30 P.M - 3:30 P.M	:	Lectures
3:30 P.M - 5:30 P.M	:	Hands on Workshop

2.) Plate Osteosynthesis (Locking Plate)

Venue	:	M.G.M. Medical College, Indore
Faculty	:	Dr. Shantaram Shetty, Mangalore
		Dr. N.S Laud, Mumbai
		Dr. Sanjeev Gaur, Bhopal
		Dr. Anant Jinsiwale, Indore
Convener	:	Dr. D.K Jain, Indore
9:00 A.M - 1:00 P.M	:	Lectures
1:00 A.M. - 2:00 P.M	:	Lunch
2:00 P.M - 4:00 P.M	:	Hands on workshop
4:00 P.M- 5:00 P.M	:	Clinical Case Presentation & Interactive Session with faculty

Conference Dedicated to Late Prof. S.K. Ohri :

6:00 P.M - 7:00 P.M	:	Inauguration, Venue - M.G.M Medical College Auditorium.
7:00 P.M - 8:00 P.M	:	Entertainment extravaganza
8:30 P.M onwards	:	Dinner , MGM Medical College Lawns , Indore

Omkareshwar
Spiritual blog of life, love and spirituality on the ascension.
Distance from Indore - 77 km

MPORTHOCON 2008

Provisional programme : Saturday, 4th October, Hotel Sayaji, Indore

(HALL-A) Sayaji Mahal *CME dedicated to Late Prof. V.S. Inamdar*
"Spine Affections"

8:00 A.M - 9:00 A.M	:	Registration and Breakfast
(9:00 A.M - 11:30 A.M)	:	CME
Faculty	:	Prof. D.K.Taneja
		Prof. Subir Mukherjee, Raipur
		Prof. Rakesh Bhargava, Jaipur
		Prof. Anil K. Jain, New Delhi
		Dr. Vinod Agrawal
		Dr. Bhaven Jhankariya, Mumbai
		Dr. Nagesh Bhandari, Ahmedabad
Convenor	:	Dr. S.N Goyal , Indore
11:30 A.M - 11:45 A.M	:	Tea Break
11:45 A.M. - 1:45 P.M.	:	**GUEST ORATIONS**
1. Dr.B.B.Ohri Oration	:	Prof. Ramesh Sen, PGI , Chandigarh
2. Dr.R.K. Moorthy Oration	:	Dr.Ashok Verma,Sagar,Expresident,MPIOA
3. Dr.O.P Sharma Oration	:	Prof. Prakash Kotwal, AIIMS, New Delhi
1:45 P.M - 2:30 P.M	:	Lunch
2:30 P.M - 5:30 P.M	:	**Guest Lectures**
		Free paper - Session I & II
5:30 P.M - 7.30 P.M.	:	**GBM**
(HALL-B) Sapphire		
2:30 P.M – 5:30 P.M	:	**Guest Lectures, Free paper** Session/ Video Session
8:00 P.M. onwards	:	**BANQUET AND ENTERTAINMENT at Vrindavan, Hotel Sayaji**

Provisional programme : Sunday 5th October, Hotel Sayaji, Indore

(HALL-A) Sayaji Mahal		
8:00 A.M - 9:30 A.M	:	SYMPOSIUM on "Osteosarcoma"
Faculty	:	Prof. Subir Mukherjee, Raipur
		Dr. Sudhir Kapoor, New Delhi
		Dr. Ajay Puri, Tata Memorial, Mumbai
		Dr. Alok C. Agrawal, Jabalpur
Convenor	:	Dr. Suneet Tandon, Bhopal
9:30 A.M - 11:00 A.M	:	P.G. Paper Competition
11:00 A.M. - 12:00 P.M.	:	Asstt. Surgeon Paper Competition
12:00 P.M - 1:45 P.M	:	Guest Lectures, Free Paper Session
1:45 P.M - 2:30 P.M.	:	P.G. Quiz, Convenor : Dr. Sunil Rajan, Indore
2:30 P.M – 3:30 P.M	:	Lunch
3:30 P.M. - 4:30 pm	:	Free Paper Session
4:30 P.M.	:	Valedictory Function
(HALL-B) Sayaji Mahal		
12:00 PM- 1:45 PM	:	Free Paper Session/ Video Session
3:30 P.M. - 4:30 pm	:	Free Paper Session

Guest Faculty

Prof. S.C Goyal, President, IOA,
Prof. HKT Raza, Presidentelect, APOAS
Dr. Anant Joshi, Mumbai
Dr. Ashok N Johari, Mumbai
Dr. Dinesh Sonkar, Rewa
Dr. Sanjay Desai, Mumbai
Dr. Pankaj Jindal, Pune
Dr. Sameer Gupta, Gwalior
Dr. Jitendra Shukla, Bhopal

REGISTRATION DETAILS

Up to	Up to 31st Aug. 2008	1st Sep. 2008 to 25th Sep. 2008	After 25th Sep. and Spot
Members	1200.00	1500.00	1600.00
(MP Chapter)			
Trade Delegate	1400.00	1600.00	1800.00
Non Members	1400.00	1600.00	1800.00
P.G. Students	600.00	650.00	700.00
Spouse	500.00	500.00	600.00
Children above 10 years	250.00	250.00	300.00

Workshop 3rd October 2008

Before 31st Aug. 2008 Rs. 500.00

1st Sep. 2008 onwards Rs. 600.00

Banquet Charges : Rs. 400.00

Note :

- Incidental charges Rs. 100 extra for all delegates except Spouse & Children.
- No spot registration for workshop.
- Conference kit and complimentary gifts for spot registration not guaranteed.
- Registration fee plus incidental charges of Rs.100.00 must be paid only by DD in favour of MPORTHOCON 2008 payable at Indore.
- No outstation cheques or cash will be accepted.

Please mail the registration form and draft by registered post to :

Dr. Alok Verma
Organising Secretary "MPORTHOCON 2008"
N– 90, Anoop Nagar, Indore 452 008
Ph. 0731- 2550270,
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REGISTRATION FORM

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1. _____
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1. _____

Fee Details :

(A) Conference : Rs. _____ (B) Workshop : Rs. _____ TKR ☐ LCP

© Incidental Charges : Rs. _____ (D) Banquet : Rs. _____

(E) Accompanying persons : Rs. _____ (F) Total : Rs. _____

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Please Note :

- Incidental charges are payable by delegates only and not by accompanying persons.
- Conference registration is a must for Workshop registration & Paper/Poster presentation.
- Please write the name, age and sex of children below 10 years of age to help us issue their ID cards and entry to food areas etc.
- Photo Copy of this form can be used.
- Please write your name, membership number (if applicable), address and telephone number behind the Demand draft.
- Payment out standing will be collected and any refund due will be given at the time of registration.
- Enrollment for workshop will be limited and early registration is recommended.

GUIDELINES FOR DELEGATE PRESENTATION

1. Only Registered delegates can present paper at the conference.
2. Abstract should not exceed 250 words and should be structured as title, keywords, introduction, methods, results, conclusion.
3. Author's name should be mentioned only in proforma not in abstract.
4. Once an abstract is accepted, additional authors can not be added.
5. Certificate will be issued to the presenting author only.
6. Abstract will be reviewed by the selection committee and scientific committee reserves the right to withdraw a presentation at any time and to decide the method of oral or poster presentation.
7. Scientific committee has the right to assign a presentation to any scientific session.
8. An author can submit any number of papers for consideration but only one will be selected. Poster presentation have no limit in number.
9. Only members of MP chapter are allowed to present the free paper in the conference.
10. For paper presentation in medical officer category the author should be assistant surgeon in govt. of M.P.
11. Two papers of P.G. from each institution and one paper of DNB candidate from each institution should be sent for P.G. competition. Letter from HOD of the institution should accompany the abstract.
12. Each presentation will be 8 minutes followed by discussion 2 minutes.
13. Poster should be 75 x 100 cm. in portrait shape.
14. Delegates should not submit any original photographs with abstract.
15. Only LCD projection is allowed. Slide carousels will not be available.
    - Paper C.D. should be given 24 hours before the session at preview room.
    - Use of personal laptops and memory devises is not allowed in side the hall.
    - Each video presentation will be of 10 minutes.
    - C.D. or D.V.D. should be submitted 8 hours before the session at preview room.
17. Abstract should be mailed to the following address.

Dr. Alok Verma
Organising Secretary "MPORTHOCON 2008"
N– 90, Anoop Nagar, Indore 452 008
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Mob. 9302550011
e-mail : docverma@indiatimes.com

ORTHOPAEDIC JOURNAL OF M.P. CHAPTER
VOL.17 NO.1,2008

CONTENTS

Editorial

I am glad to get the opportunity to edit the 17th volume of orthopaedic journal of M.P. chapter for the first time.

With the increasing speed and competitive attitude towards life,the incidence of high velocity road traffic accidents has increased manifolds.As the average life expectancy,standard of living has increased it has increased the burden of non traumatic arthropathies like osteoarthritis of knee,hip,cervical spondylosis.

We now are in era in which factors that affect orthopaedic conditions increasingly are identified before the damage is evident,as evidenced by our increasing abilities to treat traumatic and medically manageable orthopaedic conditions.Similarly,the impacts of advanced measures are being recognized by larger segments of the health professional community and the public alike.Orthopaedicians now have a responsibility to improve their recognition and understanding of these measures and to assess & communicate to others the potential uses,and benefits that these measures possess.This increased understanding underscores the increasing need for orthopaedicians to be able to understand each & every condition with utmost precision & to do so through increased familiarity with access to resources that can be of practical benefit to doctors & patients alike.

With advances in various orthopaedic procedures such as total joint replacements, minimally invasive joint reconstruction, minimally invasive spinal surgeries for tumours,deformities,disc prolapse like microdiscectomy etc,orthopaedics as become a clinical superspeciality with lot of advancement in the last few decades.

To cope up with this,there is a need for exchange of knowledge &skills by means of continuing medical education.This volume of Orthopeadic journal of M.P.Chapter is an attempt of step towards it..I hope you enjoy the contents of this volume as much as we enjoyed compiling the most comprehensive and interesting articles.

Dr. Sunil Rajan
Editor
ORTHOPAEDIC JOURNAL OF
M.P. CHAPTER

PRELIMINARY CLINICAL RESULTS WITH A NEW LUMBAR INTERSPINOUS SPACER

* Dr Pritesh Vyas
** Dr Vinod Agrawal
*** Dr Vikram Chatrath
**** Dr Manish maheshwari

Abstract

To study use of DIAM (Device for Intervertebral Assisted Motion) for lumbar spine surgery.

Five cases were of lumbar spine surgeries were operated using DIAM (Device for Intervertebral Assisted Motion). All patients were assessed for functional outcome using Greenhough and Fraser score. The indications for surgery were multilevel disc degeneration in four patients and single level disc degeneration with acute on chronic prolapse in one case. Four patients were young active male patients and two patients had a sedentary lifestyle. All patients were mobilized within twenty four hours of surgery.

For DIAM, at short term follow-up of 4 months, sixty percent patients (three) had excellent results and forty percent (two) had good results.

A posterior interspinous stabilizer is effective in reducing the intersegmental flexion-extension motion that is observed after a discectomy or a partial facetectomy. Realignment of the facet interface restores facet congruity. Distraction of the neural arch results in enlargement of neural foramen thereby relieving neural compression. DIAM alters load transfer through the functional spinal unit. Non fusion technology will be needed as we face younger population with multi-level disc disease.

DIAM, Spine, disc prolapse

Introduction

Very often patients with a prolapse intervertebral disc continue to suffer from back pain despite an adequate surgery. These patients are attributed to have low grade spinal instability [14]. Consequently, spinal arthrodesis is frequently performed to treat the low back pain related to instability. Spinal fusion however is associated with a multitude of problems ranging from pseuodarthrosis, adjacent segment degeneration, donor site morbidity, increased risk of infection [2,4,6,7,11,23]. Moreover in young patients with multilevel disc degeneration the reluctance to fuse multilevels is obvious (Fig 1).

Nonfusion technologies have evolved to obviate these morbidities associated with spinal fusion procedures. These include disc replacements, nuclear implants and dynamic posterior stabilization devices [18]. Disc replacements tend to preserve motion and address anterior column pathology, and are therefore contraindicated in patients with pre-existing facet arthosis. On the other hand,

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nuclear implants re-tension the annulus and are contraindicated in large annular defects[1,13,19]. Posterior stabilization devices include DYNESYS pedicle screw system, Graf ligamentoplasty and DIAM (Device for Intervertebral assisted motion). These devices alter load transfer through the functional spinal unit [15,20]. DIAM is a silicone interspinous process spacer designed to provide facet distraction, decrease intradiscal pressure, and reduce abnormal segmental motion and alignment. The theoretical goal of such an approach is to reduce abnormal painful movement, while allowing for preservation of some degree of motion. The present study reports our initial experience with the use of DIAM.

Material and Methods:

Five lumbar spine surgeries were performed using DIAM (Medtronic, Memphis, TN) by a single surgeon form March, 2007 to June, 2007. The patients were placed in the prone position in a standard manner. Decompression of the neural elements by laminotomy and discectomy was performed carefully to preserve the spinous processes and the supraspinous ligament. A space was made in the intraspinous ligaments. A distracter was then inserted between the spinous processes and the processes were distracted to a firm endpoint. Trials of various sizes were introduced to select the correct size of the DIAM (8, 10, 12, 14 mm). The distracter was removed and the DIAM was then inserted laterally between the spinous processes. It was gently tapped into place with the use of a small mallet. Two independent ligatures were then passed around the upper and lower spinous processes, respectively, by means of an attached needle. The laces were then passes through loops on the DIAM, tensioned, and then secured with crimpling of tubular rivets (Fig 2). The surgical wound was then

Table 1.

Indication	Level	No of DIAM inserted	Pre-op scores	Post-op scores	Age/sex	Occupation	Symptoms	Size of DIAM
Acute on chronic disc prolapsed	L4-5	1	10	85	27/M	Pilot	Back pain radiated to left side	10mm
Multilevel disc degeneration with disc prolapsed	L3-4, L4-5	2	15	75	29/M	Desk Work	Back pain, walking distance 5 min, tingling numbness on rt side	10mm, 12mm
Multilevel disc degeneration with disc prolapsed	L3-L4	1	13	90	31/M	Carpenter	Back pain, radiation to lt side	10mm
Multilevel disc degeneration with disc prolapsed	L4-5	1	15	75	39/M	Desk Work	Back pain radiation to lt side	10mm
Multilevel disc degeneration with disc prolapsed	L4-5	1	10	84	51/F	Housewife	Back pain , walking distance 5-10 min, tingling numbness in both lower limbs	10mm

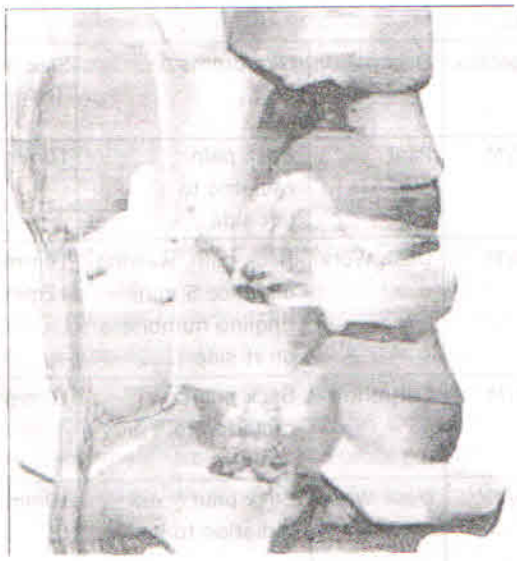
closed in standard fashion.

The pre-operative work up consisted of plain and dynamic flexion-extension skiagrams and magnetic resonance imaging. The indications and relevant patient data are mentioned in

All patients were mobilized within twenty four hours of surgery. All patients were assessed for functional outcome preoperatively and postoperatively at 6 months using Greenhough and Fraser score [10].

RESULTS

At short term follow-up of 6 months, sixty percent patients (three) had excellent results and forty percent (two) had good results. There were no intraoperative or postoperative complications such as occurrence of neurological symptoms, vascular injuries or wound infections. All the patients were carrying on with their respective occupations at three months follow-up. The average scores improved from 12.6 to 81.8.



DISCUSSION

DIAM is comprised of a silicone core wrapped into a polyester sheath connected to artificial ligaments of the same material (Fig 3). It helps to assist the degenerated segment in both flexion and extension through its novel dynamic ability to stretch and compress in synchronization with the normal movement of the functional spinal unit. The preloading of the implant permits the posterior tension bending, restoring the natural ligamentotaxis. The resistance to flexion is controlled first by decompression of the DIAM and then by stretching of other passive structures i.e.; muscles, fascia, and ligaments. During extension the preloaded DIAM continues to be compressed until reaching its limit of compressibility. The DIAM behaves like the pivot of the fulcrum, avoiding facet impingement. The height and preloading of the DIAM manage the range of motion of the fulcrum in the area of the neutral point. Thus, the motion of the FSU is controlled both in flexion and extension [5,22].

The most commonly used technique in treatment of spinal stenosis is laminectomy. Since a simple laminectomy may be insufficient it is combined with facetectomy. This type of excision thereby involves excision of the posterior column. This entails iatrogenic development of instability in 2 to 15 percent of cases. This risk of secondary instability necessitates the role of spinal fusion. Arthrodesis includes both short term and long term morbidities including donor site pain, psuedoarthosis and adjacent segment degeneration. Elastic stabilization could be a good alternative to fusion in which arthrodesis is too morbid a procedure. Studies have reported significant increases in flexion-extension, axial rotation, and lateral bending at the segment adjacent to a single or two-level pedicle screw construct or a fused segment [13,21]. Degeneration of the adjacent segment results from stress concentration above or below the fusion. A posterior translation with hyperlordosis results in a

foraminal narrowing due to a "pinch" effect. The ability of DIAM to stabilize the motion segment and at the same time not affect adjacent level kinematics may allow for a gradual normalizing of load transfer across segments adjacent to a fusion. It can also be used in addition to lumbar stabilization in cases in which the disc adjacent to the fused area is initially degenerated [3].

Although discectomy is quite effective in relieving radicular symptoms, persistent mechanical low back pain is not uncommon. The back pain may be related to disc degeneration and the ensuing altered kinematics at the involved segment. Various biomechanical investigations [8,9,16] that reported a significant increase in the primary angular motions at the operated lumbar segments after partial discectomy. A posterior interspinous stabilizer is effective in reducing the increased segmental flexionextension motion and lateral bending motions that is observed after a discectomy or partial facetectomy [17].

The facet joints have an absorbing and a stabilizing role. When a lordotic posture is used, the downward transmission of forces results in redistribution of loads which is transferred posteriorly to the facet joints. Their impairment also results from an ongoing aging process. Any weakening of the facets makes the disc liable to herniation. The creep deformation i.e. the aging process leads to a permanent gradual collapse of the disk height. This too results in the transfer of physiological load to the posterior facets. Clinically this manifests as pain emanating from the malaligned swollen facets and the patient assumes a posture of lumbar flexion, to transfer loads away from the posterior columns. The Device for Intervertebral Assisted Motion (DIAM) acts as a shock absorber. It restores the vertical component of the posterior moment arm, which helps reestablish ligamentotaxis. Realignment of the facet interface restores the facet congruity (Fig 4). Distraction of the neural arch results in enlargement of the neural foramen, relieving neural compression [22].

The clinical indications for the use of dynamic stabilizing devices have not been clearly defined. Various authors have listed degenerative disc disease, disc herniations, recurrent disc herniations, lumbar instability, spondylolisthesis, and spinal stenosis as potential indications [3,5,14,17,22]. The wide range of diagnoses and the varying treatment protocols make it difficult to adopt a specific approach to the application of DIAM in clinical situations. Biomechanical studies would certainly aid in rational selections of indications for use of DIAM.

This study presents our initial experience with this novel device. It has been implanted extensively in the western world with favourable results. Our early results are also encouraging. However further long-term studies with a larger number of implantations would help to define its use in the Indian scenario.

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Evaluation And Outcome Of Intertrochnteric Osteotomy In Ununited Intracapsular Fracture Neck Femur

-Dr. Vivek Singh, Dr. Sameer Gupta
Gajraraja Medical College & Jayarogya Hospital, Gwalior.

ABSTRACT

Generations of Orthopaedic surgeons have recognised the difficulties met with the treatment of fractures occurring in femoral neck. Treatment of non-union of fracture neck femur is still more challenging than from fracture itself. There are so many modalities have been tried to get fracture union. Valgus intertrochanteric osteotomy and small diameter dynamic hip screw fixation is one of them. Present study is to evaluate the results of intertrochanteric osteotomy and fixation with small diameter Dynamic hip screw along with an antirotational screw in fracture nec femur more than six weeks old. Patients were evaluated with Harris Hip Score. This is a further step in the direction of achieving a functional hip in late fracture neck femur without disturbing the viable head.

Twenty patients of ununited (>6 weeks old) intracapsular fracture neck femur in the age group 20-50 years (avergae 36.55 years) were subjected to valgus intertrochanteric osteotomy and osteosynthesis by small diameter DHS. The patents were followed up from 6 months to 3 yrs.

Ninteen cases were united by 6 months after the procedure (95% osteotomy in 8 cases, which is acceptable as their apparent lengths were ezual in bothe the limbs. In one case there was osteonecrosis, cut through of dynamic hip screw due to collapse of head and shortening of 5 cm. Excellent and good results are seen in 18 patients. Fair and poor in one patient each.

Valgus intertrochanteric osteotomy with small diameter DHS fixation is a viable option for ununited fracture neck femur. It is a simple easy to perform and good treatment. Failure of any case can be treated with other secondary procedure.

INTRODUCTION

Generations of Orthopaedic surgeons have recognised the difficulties met with in the treatment of fractures occuring in femoral neck. This is an unique condition because inspite of many methods and procedures have been tried to treat this fracture, it is still known as the "UNSOLVED FRACTURE" as results are still far from ideal.

In 1927, it was Pauwels who recognized the fact that if shearing forces acting on the fracture site was transformed into compression forces by changing the fracture line from vertical to horizontal, nonunion of femoral neck would consolidated within a few months. This is the basic idea behind intertrochanteric osteotomy which reorients the fracture line from vertical to horizontal by resecting a laterally based wedge of bone at the level of lesser trochanter. Present study is to evaluate the results of intertrochanteric osteotomy and fixation with small diameter Dynamic hip screw along with an antirotational screw in fracture neck femur more than six weeks old. This is a further step in the direction of achieving a functional hip in late fracture neck femur without disturbing the viable head.

MATERIAL AND METHODS -

Twenty patents of ununited (>6 weeks old) fermoral neck fracture in the age group 20-50 years were subjected to valgus intertrochanteric osteotomy during the period May 2003-April 2005. These patients were followed for a minimum period of 6 months. The case for this study have been selected from the patients attending the out-patient department of Orthopaedics and from those arriving at the emergency department of Jayarogya group of Hospitals, Gwalior. Each patient was subjected to clinical and radiological examination.

Inclusion Criteria - 1. Close ununited fracture neck femur in patients coming after 6 weeks or more of injury. 2. Failed internal fixation. 3. Age less than 50 yrs.

Exclusion Criteria - 1. Radiographic evidence of avascular necrosis in head of femur. 2. Other associated fractures of same limb. 3. Severe systemic disorders. 4. Un cooperative patients with neurological and psychological disorders.

Age more than 50 years. The dynamic hip screw used in this series had following characters.

Dynamic Hip Screw - Material -316L stainless steel. The screws that were used in lengths from 60 mm to 80mm in 5 mm increments.

Important dimension	Standard Screw	Small Screw
Thread diameter	12.5 mm	10 mm
Thread length	22mm	20 mm
Shaft diameter	8 mm	7 mm

Operative Technique : Anaesthesia -Spinal anaesthesia or general anaesthesia was used. Position- the patients was laid supine on the Orthopaedic table and multiplane image intensifier for AP and lateral view. Close reduction of fracture was done in late cases by traction, abduction and internal rotation in extension (Whitman's method). In difficult cases, we obtain the reduction by lead Better's method. In none of the cases, open reduction was required.

Approach : Proximal femur was exposed by standard lateral thigh incision, approximately 10 cm long beginning at the greater trochanter and running down the thigh in the line with the lateral femoral condyle. Fascia lata was split in the line of incision. The origin of vastas Lateralis was incised in the posterior half and along the linea aspera.

Procedure : In previously inoperated cases, after reduction a guide wire was inserted, using an angle guide. The angle at which the wire was to be inserted was approximately determined by subtracting repostioning angle from 135 degree, taking care that tip guide wire reached the apex of the head or just inferior to it.

In cases prviously treated by multiple cancellous screw, asnis screw or dynamic hip screw, implants were removed from the head. The guide wire was passed in such a way that it reached intact portion of head preferably in the center or posteroinferior quadrant of the head.

There should be dense enough cancellous bone so that the threaded portion of dynamic hip screw can take a firm grip. The point of insertion of this guide wire is agian determined in such a way that it subtends and angle of "135 degree - repositioning angle" to the lateral

cortex of the femur. Another guide wire was passed proximal to and parallel to first guide wire to act as a derotation wire while reaming and to guide the derotation screw later. Triple reamer was used for reaming the length of screw over the first guide wire. Appropriate size dynamic hip screw was introduced after measuring and tapping the hole. In most of the cases 5 hole/135 degree plate was applied over centrally placed guide wire and 6.5 mm cancellous screw was introduced over superiorly placed guide wire and 6.5 mm cacellous screw was introduced over superiorly placed guide wire afer drilling it by cannulated drill bid. Then plate was removed from the dynamic hip screw. The previously prepared wedge of metal was postioned in such a way that AB=CD=DE (Figure2). The osteotomy site was then marked with electric cautery. Multiple drill holdes were made along the line of osteotomy, particularly of the medial cortex. An osteotomy was performed using either an electric saw or a sharp osteotomy. First along the CD and BD to remove the wedge of bone and then it was extended along CD to DE to cut the medial cortex also.

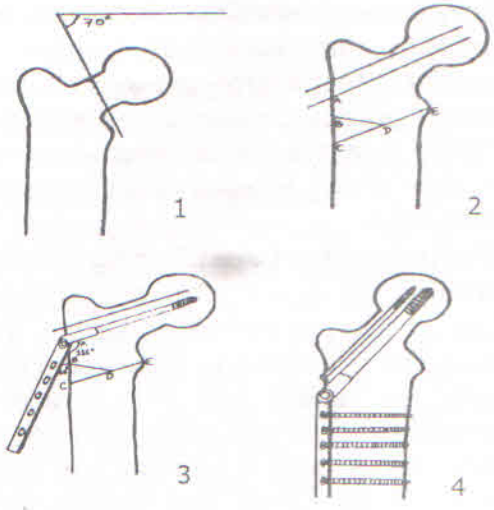
Plate was applied over the dynamic hip screw and brought along the shaft with the help of the plate holding forceps, by rotating the proximal fragment and abducting the thigh. Holes over plate and bone were drilled and 4.5 mm cortical screws were introduced after measuring and tapping. The compression and derotation screws were tightened gradually to achieve a good compression across the fracture site. Final position of fracture, osteotomy, lateral view. When ever possible we have used small diameter (10 mm) d7ynamic hip screw in previously operated cases. It helped us to achieve compression at fracture site inspite of that a large gap was left behind due to previous implants. The wound was closed in layers over a negative pressure suction drain. Asceptic adhesive dressing was done.

Postoperative Care : Turning in bed was allowed 24 hours after the operation, using pillows to prevent adduction. Static Quadriceps exercises was encouraged as soon as patient was in a position to tolerate. Patient was allowed to sit on next day. Partial weight bearing was started after three weeks and further weight bearing was permitted according to the progress of union at osteotomy and fracture site.

Follow up : Radiological assessment : This assessment was done postoperative and at rgular interval of one month for three month for three months and then at an interval of three months. The union at osteotomy site and fracture site placement of screw in the head, its advancement into the joint space; any change in the Pauwel's angle which had been obtained after operations were noted in X-ray. Also the complications like femoral neck absorption and avascular necrosis of the head was checked upon.

Clinical Assessment : At the time of follow up a detailed clinical analysis was carried out interms of pain, gait, functional activities, absence of deformity. Range of motion using Harris Hip Score (1969). The results were evaluated by adding score of all parameters :

Excellent	:	90-100
Good	:	80-89
Fair	:	70-79
Poor	:	69 or less



Results - 11 males and 9 females, age ranging from 20 to 50 years (average - 36.55 years). Anatomically 16 fractures were transcervical, 2 were subcapital and 2 basal. According to Pauwels classification 15 cases were type II (30-70 degree), 5 were type III (>70 degree) and none was type I (>30 degree). Untreated patients coming late were slightly higher (11) then patients with failure of implants (9). Small diameter DHS was used in 14 cases. Whenever possible we have used anti rotaitonal issue for prevention of rotation. In some cases due to lack of space antirotation wire was kept in place, preoperative average Pauwels angle of 68.85 degree was converted to a average of 26.2 degree after valgus osteotomy.

Average follow up was 18 months and all cases included were followed up for more than 6 months. Osteotomy united in <3 months in 18 cases while it took>3 months in 2 cases. The results were formulated using the Harris Hip Score (1969). In our study excellent to good results were achieved in 18(90%) cases.

There was no shortening in 10 cases while 1 cm. shortening remains after osteotomy in 8 cases, which is Compalible with shoe raise (hed raise). In one case there was osteonecrosis, cut through of dynamic hip screw due to collapse of head and shortening of 5 cm. In one patient 1 cm. lengthening was observed.

Discussion - The history of femoral neck fracture is one of a persistent search for adequate reduction and fixation in an effort to minimize the problems of nonunion and avascular necrosis. Problem of delay between occurrence of fracture and starting of appropriate treatment compounds the problems like avascular necrosis, non union, up-riding of shaft, soft tissue contractors etc. Once failure of internal fixation is diagnosed , numerous treatment options exist. Surgical approaches include refixation with or without bone graft, vascularized fibular graft, muscle pedicle bone graft, arthrodesis, arthroplasty and osteotomy. Arthrodesis has a high rate of failure, but when it is successful, it leads to a fused hip. It is difficult to convince a young patient that a fused hip may be the best option in the long term.

Use of vasularised muscle pedicle bone graft placed posteriorly on he femoral neck has been popularized by meyers (1980) who has advoacated this technique in resh femoral neck fractures and nonunions. The initially reposted success has not been reproduced in other studies.

King (1939), Henderson (1940) and Nagi et al. (1986) had produced good results by fibular graft in patients of un united fracture neck femur. However vascular fibular osteosynthesis has been not universally accepted as the standard mode of management because of

thrombosis of vessels upto half of the cases.

Hemiarthroplasty should be reserved for the elderly patients (> 60 physiological age) when head in not viable and life expectancy is less and patient is a community ambulater or minimal household ambulator.

Primary total hip arthroplasty is indicated in patients with significant pre-existing joint distruction caused by rheumatoid arthritis, avascular necrosis or osteoarhiritis.

Intertrochanteric osteotomy is the most viable option for treatment of ununited fracture neck femur in patients presenting late after injury. It provides high proportion of good results leaving behind a natural head, which is probably the best alternative to prosthetic replacement.

Wide difference of opinion exists regarding prosthetic replacement versus internal fixation and osteotomy. A meta-analysis of 106 published reports by Grace L. Lu. Yao et al. (1994) have shown slightly higher rate of mortality at thirty days after arthroplasty than after internal fixation. In another series of 714 patients had better ambulatory ability (p=0.001) and used walking aids less than hemiarthroplasty ones (p-0.001), but at one years osteosynthesis patient had a higher reoperation rate (17%) than hemiarthroplasty ones (9.5%).

The operation for inserting a prosthesis generally is considered to be more extensive than that required, blood loss is greater and perioperative mortality is also slightly greater. Other complications after hemiarthroplasty are infection, disassembly of prosthesis, implant fracture, acetabular erosion, heterotropic calcification and vertical subsidence or loosing. According to Boyd and Salvatore (1964) "The sacrifice of the head and neck, and replacement by a metallic foreign substance is not the answer for the majority of patients; in over half, the best available material is in the acetabulum and its indiscriminate removal should be avoided.

In the present study 20 cases of ununited fracture neck femur more than 6 weeks old were treated by intertrochanteric osteotomy fixed with dynamic hib screw with 135 degree plate. Out of 20 cases 9 were operated previously, but union had failed and 11 cases presented end late and had not taken any surgical treatment till admission in our hospital.

Basic principle of valgus intertrochanteric osteotomy was established by Pauwel in 1935, later modified by Muller. The purpose of this osteotomy is to convert all shearing forces acting at fracture site into compressive forces by changing the fracture line from vertical to horizontal. This can be achieved if Pauwel's angle is brought aroung 25 degree (Muller 1984). From intertrochanteric area a laterally based wedge removal can reorient the plane of nonunion from vertical to horizontal. Calculation of Pauwel's angle, re-positioning angle and angle of wedge removal from preoperative drawing of X-ray, are very important to make the method effective.

In the present study of 20 cases, all of the patients belong to young age i.e. 20-50 years of age with average age of 36.55 years. In old age, we can do prosthetic replacement but in younger age preservation of head is to be given

prime importance. The incidence of nonunion due to vascular reason is also common in this age group.

In this series out 20 cases, 9 cases who were operated previously there were 7 cases of multiple cancellous screw failure while Dynamic hip screw failure and Asmis screw failure was seen each in one case. Rest of the 11 patents had not taken any surgical treatment till admission.

One patient had a stress fracture of neck femur was treated by multiple cancellous screw fixation which got infected. Implant removal was done and cavity was filled by vancomycin impregnated bone cement. Patient was permitted to mobilize non-weight bearing on crutches. After three months, when infection had subsided , he was again operated, osteotomy and dynamic hip screw fixation was done 2½ yrs. ago. Now the patient is doing alll his duties as aBSF constable with Harris hip score of 96. His dynamic hip screw was removed 6 months back.

In 10 cases we were able to fully correct the preoperative shortening. In 8 cases there was 2 cm. preoperative true shortening which remains upto 1 cm. after osteotomy, which is acceptable because their apparent lengths were equal in both limbs. One patient had shown true shortening of 5cm which was only failure of this series.

Authors	No. of Pts.	Implant used	AVN	Union Rate	HHS
Hunang 1984	16	Jewett nail/Richards Screw	4	16(100%)	
Marti 1989	50	120 Degree angle Blade plate	NK	43(86%)	91
Ballmer 1990	17	120 Degree angle Blade plate	2(THR)	15(88%)	
Anglen 1997	13	120 Degree angle Blade plate	2(THR)	13(100%)	93
Raaymakers 2001	70	120 Degree angle Blade plate	40 (20THR)	61(87%)	79
Vasilios Mathews 2004	15	120 Degree angle Blade plate	5 (4-THA)	10(67%)	
Our Study 2005	20	Small Diameter DHS	1	19(95%)	87.55

In a series of 17 cases Ballmer et al. (1990) have shown the results of Pauwel's osteotomy and achieved union in 12 out of 17 cases (70%). Three cases (two technical) errors needed revision before union was successful, increasing the over all consolidation rate of 88%. In our series we have achieved union in 19 out of 20 cases with a consolidation rate of 95%.

In 2001 Raaymaker reported a large series of 70 valgus osteotomies during a period of 24 years. In his series union rate was 87% and the mean Harris hip score of 79. Complications were four blade plate penetration, nine persistent nonunions and one haematoma and with 57% patient had developed new or progressive osteonecrosis with 20 patients eventually requiring total hip replacement.

In our small series complications were minimal. There was only one case of dynamic hip screw penetration with avascular necrosis of head. One case has shown nonunion despite osteotomy and only one case of superficial infection. The patient one case who had shown avascular necrosis of head of femur his dynamic hip screw was removed and ultimately he will require prosthetic replacement. The average Harris Hip Score of 87.55 is similar to other studies.

Comparison of Pauwel's angle achieved - In the series of 13 patients were Anglen et al. (1997) the average change in radio graphic plane inclination was Pauwel's angle in 10 cases (50%). In the other 10 cases the Pauwel's angle was ranged between 26 - 30 degrees.

Results - The table of comparative result as follows.

Authours	Excellent	Good	Fair	Poor
Huang	50.00%	31.25%	12.50%	6.25%
Anglen	62.00%	23.00%	-	15.00%
This study	50.00%	40.00%	5.00%	5.00%

Conclusion :

1. Late cases and cases with implant failure of femoral neck fractures can be successfully treated by intertrochanteric osteotomy.
2. Pre-operative planning is essential.
3. Reduction in Pauwel's angle achieved by this technique leads to early osseous union.
4. Internal splinting by dynamic hip screw with antirotational screw is reliable and effective due to rigidly hold of the fragments.
5. In cases with defect left in the head because of previous implants a small diameter DHS could afford a rigid fixation in limited bone stock leading to excellent results.
6. This technique is also helpful in correcting the shortening of the lower limb to some extent. There is minimal limp as the abductor power increased due to pulling of greater trochanter.

From encouraging results (90%) of this series, we come to conclusion that this was another attempt to protest against defeatism to the "unsolved fracture".

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PREOPERATIVE X-RAY OF UNTREATED PATIENT COMING LATE AFTER INJURY

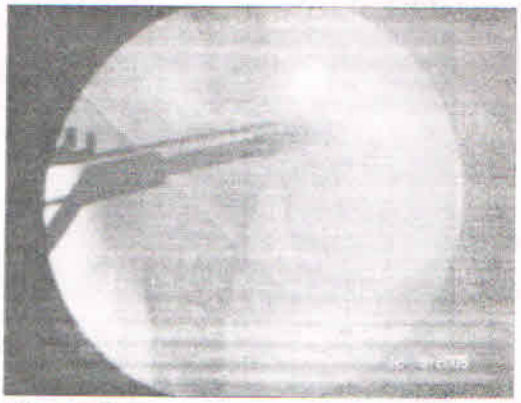


IMAGE INTENSIFIER VIEW - INSERTION OF DHS, PLATE AND ANTIROTATIONAL GUIDE WIRE

IMAGE INTENSIFIER VIEW SHOWING OSTEOTOMY

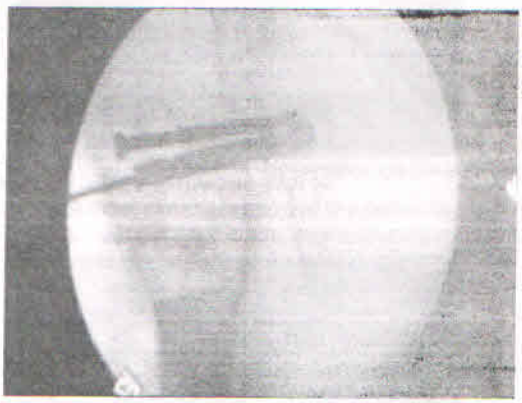
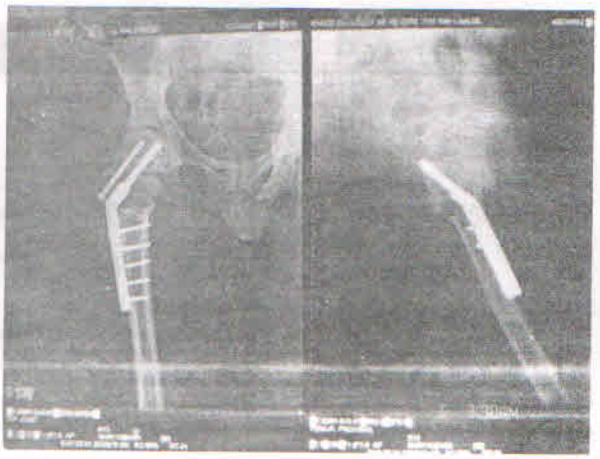
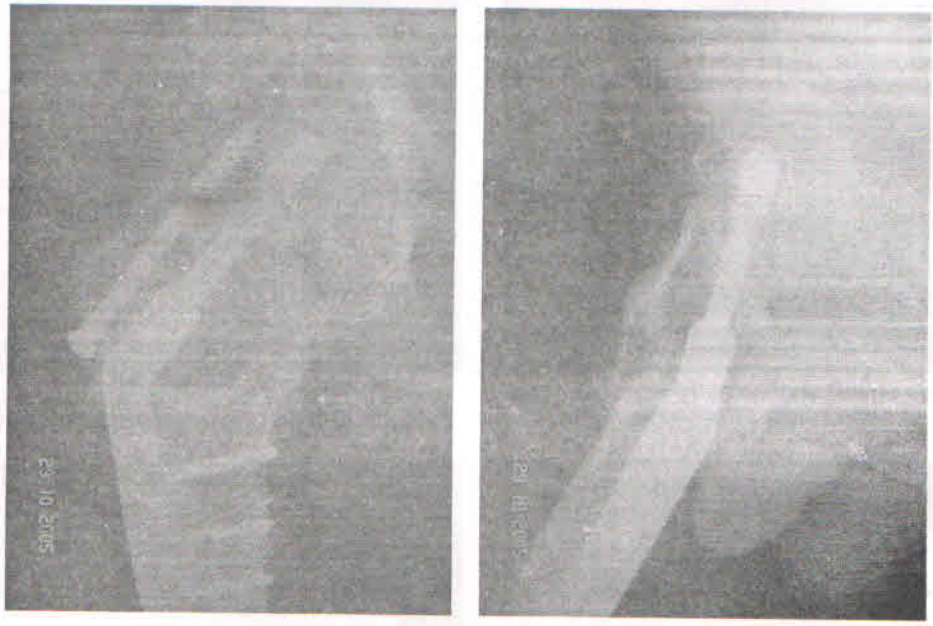


IMAGE INTENSIFIER VIEW AFTER REMOVAL OF WEDGE



IMMEDIATE POSTOPERATIVE ANTERORPOSTERIOR AND LATREAL VIEW OF X-RAY OF SAME PATIENT



X-RAY SHOWING UNION OF FRACTURE AND OSTEOTOMY SITE
AFTER THREE MONTHS

FOLLOWUP THREE MONTHS AFTER OSTEOTOMY, SAME PATIENT
WAS SHOWING DIFFERENT POSITIONS OF FUNCTIONS.
HIS HARRIS HIP SCORE IS 91.

Clinical Assessment for Deep Vein Thrombosis in Asymptomatic Indoor Orthopaedic Patients

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ABSTRACT :

Deep vein thrombosis is a major cause of morbidity and mortality in bedridden patients undergoing major orthopaedic trauma and surgeries. Clinical diagnostic decision making of deep vein thrombosis in these patients is difficult and diagnostic radiological study is many a times needed. The clinical diagnosis of deep vein thrombosis though difficult in asymptomatic patients, is made easier and effective by Wells diagnostic scoring system and morbidity and mortality due to DVT is drastically reduced in bed ridded trauma patients by this system.

Cost effectiveness is also improved by this method in Indian scenario by alleviating the need for radiological diagnostic study in every patient.

The aim of this study is to assess the validity of Wells diagnostic score and to stratify the risk as of developing deep vein thrombosis as per invididual risk scores.

Introduction :

Deep vein thrombosis is a major cause of morbidity and mortality in patients undergoing major orthopaedic trauma and surgeries. The thrombotic process int he absence of anticoagulation leads to edema, pain and immobility and in due course can lead to pulmonary embolism which can be fatal. Clinical decision making in sub clinical DVTs is difficult and diagnostic duplex study is always confirmatory.

Clinical decision making in this study is done by Well's clinical diagnostic rule. The aims of the study ae to estimate the probability of Wells clinical decision rule in indoor orthopaedic patients and to assess the validity of Wells decision rule by diagnostic duplex study and thereby to stratify the risk of developing deep vein thrombosis as per individual risk scores.

Materials and Methods

This is a prospective study between 1st September 2005 to 30th September 2006, conducted in department of orthopaedics and traumatology, with the assistance from department of radio-diagnosis, at Mahatma Gandhi medical college and Maharaja Yashwant rao Hospital, Indore

Patients who are totally asymptomatic for DVTs admitted with lower limb traumatic injuries and have either been treated conservatively or surgically included in this study. All patients in this study neither had any history or any episode of deep vein thrombosis nor had anticoagulant therapy for at least 24 hours before under going objective evaluation.

Seventy-five patients with traumatic lower limb injuries were included in this study. They were divided into two sub-groups, 54 patients under post surgical group and 21 under post-trauma group.

First clinical testing of the patients are done by individual parameters in Well's scoring system. Then patients are grouped into low, moderate and high probability groups. On the same day, patients were objectively evaluated using Duplex study in which presence of deep vein thrombosis is indicated by persistent filling defect in the colour column of the vessel lumen.

Petient examined in supine position with leg abducted and externally rotated and femoral vein examined from inguinal ligament up to the adductor canal.

Patient is then put in supine position and popliteal vein up to calf veins are examined.

Normal veins in duplex study shows spontaneous, phased flow which is unidirectional towards heart and which ceases by valsalva manoeuvre and gets augmented by distal compression.

Presence of DVT is depicted by persistent filling defect or thrombus formation in the colour column of the vessel lumen or absence of flow with absence of compression in the venous segments.

After the duplex study if the findings are positive, patients are started on prophylactic treatment of deep vein thrombosis up to their stay in the hospital, and then advised to continue this treatment at home for more than a month.

Clinical Decision Rule - Developed by wells et

Clinical Finding	Score
Activity cancer [treatment ongoing within previous 6 months or palliative]	1
Paralysis, paresis or recent plaster immobilisation of the lower extremities	1
Recently bedridden for more than 3 days or major surgery within 4 weeks	1
Localised tenderness along the distribution of the deep venous system	1
Entite leg swelling	1
Calf swelling by more than 3 cm when compared to asymptomatic leg.	1
Pitting edema [greater in symptomatic leg]	1
Collateral superficial veins (non-varicose veins]	1
Alternate diagnosis as likely or greater than that of PDVT	-2

A score is obtained by summing all the items that are udged to be present and patients grouped into :

Low probability of PDVT (,/=0) Moderate (1or 2)

High (> / = 3)

The reference diagnostic method used is Duplex study of deep venous system of the lower extremity.

A 7-11 MHz linear array transducer and long axis images are used.

Observation and results

Results were evaluated for 75 patients of whom 54 were under post - surgical group and 21 patients under post- traumatic group. Majority of patients [66] were present in 15-54 age groups. Elderly patients represented only 33% of entire sample group. Males represented 70% of entire sample. Most common diagnostic category represented in the sample was fractures of and around hip region, followed by fractures of the shaft of tibia / fibula, and fracture shaft of femur.

Table No. - 1

Age Group	No. of Pt.	Positive for PDVT
5-14	2	-
15-24	12	-
25-34	15	2
35-44	13	2
45-54	10	4
55-64	7	2
65-74	12	2
>75	4	-
Total	75	12

Miximum number of positive patients was found to be present in the 45 - 54 year age-group.

Table No. - 2

Sex	PDVT Present	PDVT Absent	Percentage Positivity
Male	08	46	14.8%
Female	04	17	19.0%
Total	12	63	16.0%

Percentage of positive females was higher than that of males.

Table No. - 3

Sub - Group	Positive Patients	Negative Patients	Positive Percenage
Post- Trauma	04	14	22.2%
Post - surgical	08	49	14.0%
Total	12	63	

Post surgical patients were found to be more positive than post trauma patients.

Patients with hip fractures showed more positivity than other fracture groups.

TABLE NO -4

PROBABILITY GROUP	LOW	MODERATE	HIGH	TOTAL
NO OF PATIENTS	30	37	08	75

Nearly 50% of patients represented the moderate probability group, followed by patient in the low and high probability groups.

TABLE NO -5

PROBABILITY ESTIMATES FOR DEVELOPING PDVT FOR THE ENTIRE SAMPLE

PROBILITY LEVEL	PDVT PRESENT	PDVT ABSENT	TOTAL	PROPORTION WITH PDVT
LOW	03	27	30	10%
MODERATE	05	32	37	13.5%
HIGH	04	04	08	50%
TOTAL	12	63	75	

TABLE NO -6

PROPORTION OF PATIENTS DEVELOPING PDVT IN POST SURGICAL AND POST TRAUMATIC GROUP

PROBABILITY LEVEL	POST SURGERY GROUP				POST TRAUMATIC GROUP			
	PDVT PRESENT	PDVT ABSENT	TOTAL	PROPORTION	PDVT PRESENT	PDVT ABSENT	TOTAL	PROPORTION
LOW	02	20	22	9%	01	07	08	12.5%
MODERATE	03	26	29	10.3%	02	06	08	25%
HIGH	03	03	06	50%	01	01	02	50%
TOTAL	08	49	57		04	14	18	

Percentage positively for PDVD in the post surgery group was highest in the high probability group [50%] and the percentage positivity for PDVD in the post trauma group was highest in the high probability group[50%] followed by [25%] in the moderate probability group.

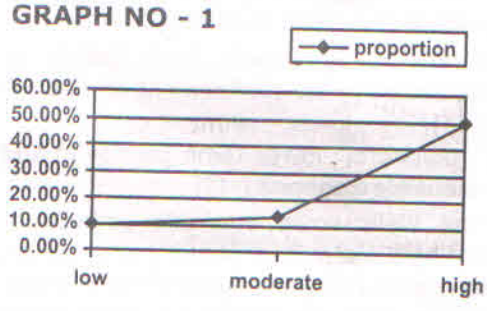
TABLE NO-7

ESTIMATION OF RISK OF DEVELOPING PDVT AS PER INDIVIDUAL RISK SCORES

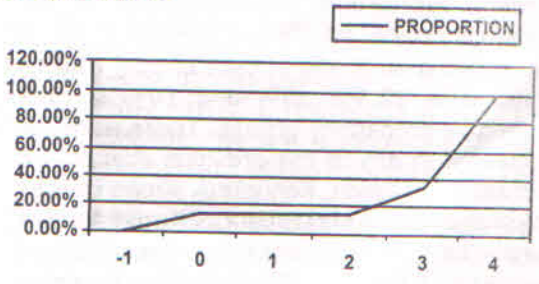
PROBABILITY SCORE	POSITIVE PATIENTS	TOTAL PATIENTS	PERCENTAGE
-1	0	06	0%
0	3	24	12.5&
1	2	15	13.3%
2	3	22	13.6%
3	2	06	33.33%
4	2	02	100%

The percentage of developing PDVT increases gradually as the risk score increases from 1 to 2 but there is abrupt increase on moving from2 to 3 and a further significant rise on moving from score 3 to 4 reaching 100%.

GRAPH NO - 1



GRAPH NO-2



The graphical representation of probability group versus positivity percent showing an algorithmic relationship between two variables and not a linear relationship.
The graph below also shows the same algorithmic relationship between individual Wells score and their positivity percentage.

Discussion

In our study : total of patients were admitted and operated in the same setting in contrast to other studies by Wells,Riddle, Sonia, Anderson, Anand,Russel Hull, where patients were referred from outside and were operated or treated conservatively in some other hospital. Male : female ratio is more in our study [2.5:1] compared to study be wells [1.5:1] as males are more prone to road traffic accidents in our country. Percentage of female patients is less [23.5%] compared to that of Wells study and minimum a g e o f patient included in this study is 7 years compared to Wells study where it is 14 years. Percentage of positive patients for PDVT [16%] which when compared to Wells study shows slightly higher value [of the order of 2-3] probably due to the fact that the diagnostic study used in this study [duplex study] is more sensitive and specific compared to that [B-mode compression ultrasonography] used in other study.

Calculation of positive percentage for PDVT was calculated separately in post -traumatic and post surgical patients as well as according to the fracture configuration for the first time in this study and not been done by any other author. For the entire sample the likelihood of developing PDVT is calculated as 10%, 13.5 and 50% for low, moderate, and high probability groups respectively which was comparable to study by Wells. For the post surgery sub group the probability is the probability is 9%, 10.3% and 50% for t h e respective groups and in case of post trauma group it is 12.5% 25% and 50% for the respective probability groups. These were not calculated in any of the previous studies. Dr. Michael Rud Lassen, Kenneth A Bauer, Bengt I Eriksson and Prof Alexander GG Turpie, for the European Pentasaccharide Hip Elective Surgery STudey (EPHESUE) Steering Committee in 2002 compared postoperative fondaparinux versus preoperative enoxaparin for prevention of venous thromboembolism in elective hip-replacement surgery and interpreted that drugs that act through specific inhibition of factor Xa, such as fondaparinux, could be more effective than low molecular weight heparins in prevention of venous thromboembolism in patients undergoing hip replacement surgery. Steven McGee, an associate professor of internal medicine in 2002 has done an excellent job of integrating disparate subjects and quoted "Evidence Based Physical Diagnosis attempts to integrate the tradition and history of physical examination with the growing body of evidence about the diagnostic accuracy and reliability of the various physical findings that physicians use to assess patients." (43)

Joel Constans, Catherine Boutinet, L. Rachid Salmi, Jean 0 Claude Saby, Marie- Line Nelzy, Patrice Baudouin, Francoise Sampoux, Jean - Marie Marchand, Caroline Boutami, Veronique Dehant, Stephane pulici, Jeanpaul Gauthier, Veronique Cacareigt-bourdens, Damien Barcat and Clauede Conri in 2002 compared 3 clincical prediction scores for the diagnosis of lower limb deep venous thrombosis in outpatients. (25) Sensitivity and specificity was calculated for three clinical scores : (Wells [nine components], Kahn [four components], and St. Andre [six components]) and developed a new score by multivariate analysis, and then compared this score with the others in a new sample.

They found that Wells score was a better predictor of deep venous thrombosis than the Kahn and St. Andre scores.

A New score developed as follows :

[male sex (+1), lower limb palsy or immobilization (+1), confinement to bed >3 days (+1), lower limb enlargement (+1), unilateral lower limb pain (+1) and other plausible diagnosis (-1)]

The Wells score and this ambulatory score had similar test operating characteristics. They interpreted that new six-component score had similar diagnostic utility as the nine-component Wells score among outpatients being evaluated for deep venous thrombosis.

Conclusion :

Making a diagnosis of deep vein thrombosis is fraught with error even in symptomatic patients due to the non-specific classical signs and symptoms to diagnose PDVT with great precision it requires skilful application of clinical assessment criteria which is reliable, easily applicable and valid for traumatic patients. Wells CDR fulfils all the above criteria.

Applicability of CDR alone has the potential to reduce the morbidity and mortality to a large extent in lower limb injury patients suspected of having PDVT. Once patient's probability of developing PDVT is determined by use of CDR, evidence based diagnostic testing [in this case Duplex study] can confidently determine the persence of PDVT.

The probability levels determined by the CDR have a strong correlation with the actual chance of developing PDVT. But the relation is not linear but logarithmic. This shows that direct anti-thrombotic therapy can be started for those patients who have high probability CDR scores without waiting for radiological confirmation and this makes CDR a cost effective tool.

Results in our study also show that the chances of developing deep vein thrombosis are alarming [as high as 16%] in Indian scenario as compared to published studies. Thus further studies in this regard are required in Indian scenario.

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Title : Role of Calcium Hydroxyapatite in depressed tibial plateau Fractures.

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Abstract

Intraarticular fractures of upper end tibia have been considered thorny management problems primarily because of languishing long term complications associated with these types of injury, demeaning the functional outcome. The residual disabilities are attributed not only to the severity of injury but also to the complications and side effects of treatment method used. Management of displaced tibial plateau fractures by plaster cast immobilization often lead to fracture displacement and eventually an unsatisfactory result. On the other hand, traditional from of open reduction and internal fixation with bone grafting has a high incidence of soft tissue problems. Minimally invasive techniques with use of calcium Hydroxyapatite fall in between these two methods of management. This study was undertake to secoth effectivenen of Title Rold of Calcium Hydroxyapatite in depressed tibial plateau fractures.

Results : At 12 month follow up mean range of knee motion was 127 degree. Incidence of ligamentous injuries in our series was 21%. The average time to union was 16.7 weeks.

Use of Calcium Hydroxyapatite as a bone substitute along with minimal invasive surgery can be recommended for the treatment of depressed tibial plateau fractures as it avoids all the donor site morbidity associated with bone grafting.

INTRODUCTION :

Intrarticular fractures of upper end tibia have been considered thorny management problem primarily because of languishing long term complications associated with these types of injury, demeaning the functional outcome. The frequent complicattions in form of mal-alignment, incongruity of joint surface, instability of joint, loss of range of motion and residual deformity prevent smooth daily activities. The residual disabilities are attributed not only to the severity of injury but also to the complications and side effects of treatment method used.

In fracture of tibial plateau precise reduction of articular surface with stable fixation restores the mechanical axis allowing early mobilization. Open reduction & internal fixation has significant complication rate, which has encouraged interest in percutaneous and lesser invasive techniques. Minimally invasive surgeries are being developed and utilized in all branches of surgery. The advantage of reduced morbidity & reduced hospital stay are all well decumented.

The treatment of choice for displaced fractures of the tibial plateau is considered to be internal fixation. The most common patterns encountered are split depression and localized depression fractures, both of which often require bone grafting in order to augment the internal fixation. Recently biomaterials have been developed which avoid the need for bone gafting. Modified hydroxyapatite blocks are made of calcium hydroxyapatite in highly crystalline form. The body absorbs it slowly. It derived from bovine bone which has been sintered at a very high temperature of +500 degree centigrade. this leaves only pure inorganic structure. It does not carry any risk of transmission

of any disease. The material can be used to fill contained defects in cancellous bone. While it has less energy absorption capacity than cancellous bone, its ultimate strength six months after implantation has been found to equal or surpass that of cancellous graft at similar interval following implantation. It is an excellent osteoconductive scaffolding for bone ingrowth. It has been approved as bone void filler by FDA in 1998.

This study was undertaken to see the effectiveness of Calcium Hydroxyapatite as a filler substance in depressed tibial plateau fractures.

Material & Methods :

In this prospective study 27 patients with closed depressed tibial plateau fracture treated by minimal invasive surgery and calcium Hydroxyapatite were included in this study of which 3 patients were lost to follow up period of 12 months and hence excluded from the study. After clinical and radiological assessment the fractures were classified using the classification of Schatzker et al. Only depressed tibial plateau fractures (i.e. Schatzker type II, III, V, VI) were included in the study and those not depressed (Schatzker type I, IV) excluded.

Operative Technique :

All patients were operated in supine position under spinal anaesthesia under tourniquet control.

All fractures were reduced by indirect (ligamentotaxis and precutaneous methods under image intensifier guidance and the implant selection was done as per the fracture configuration.

Schatzker Type II & III

Elevation of depressed fragment through a window in the lateral cortex and final fixation was done with two 6.5cm CCS with washer. The metaphyseal defect filled with Calcium Hydroxyapatite blocks. Fractures with comminution at the lateral cortex were supported with a buttress plate as in type I fractures.

Schatzker type III the depressed fragment was elevated through a cortical window, fixed with 6.5 mm CCS and augmented with Calcium Hydroxyapatite as in type II fractures.

Schatzker Type V

Both condyles fixed with a buttress plate and the less involved condyle with 6.5mm CCS. The associated depressed segment was elevated through a cortical window and the defect so created filled with Calcium Hydroxyapatite blocks.

Schatzker Type VI

Fracture fixation done with locking compression plate.

Postoperative Protocol :

Gentle active assisted knee bending exercises were begun from 2nd POD. Crutch walking was begun, but no weight-bearing was permitted.

Partial weight bearing was allowed at 6 weeks and commenced to full weight bearing by 3 months depending on radiological union.

Follow up :

Follow up was done at monthly interval for 6 month and then at 2 month interval. At each follow uppatients were assessed clinically and radiologically. The Rasmussen score was used to evaluate function. The functional outcome parameters were measured by same observer to minimize the interobserver bias.

Radiographs were used to assess the degree of maximal joint depression before and after operation and at follow-up. The reduction was graded as excellent if the residual depression was 2 mm or less, satisfactory if it was between 2 and 5 mm and poor if it was greater than 5 mm keating et al.

Table - 1 Distribution of Fracrure types as per age

Type of fracture (Schatzker's type)	No. of patients	Average age
II	9	41.11 yrs
III	5	40.00 yrs.
V	8	42.60 yrs.
VI	2	30.00 yrs.
Total	**24**	**37.33 yrs.**

The mean range of flexion was 127 degree at 12 month follow up. with no loss of extension. One patient developed knee stiffness with knee flexion less than 90 degrees.

The incidence of ligamentous injuries in our series was 21%. Medial collateral ligament injury was suspected in two (1 type II and 1 type III) and lateral collateral in two (both type VI) and one combined ACL and medial collateral ligament (type II). All injuries were treated conservatively. At 12 month follow up none had symptomatic residual instability.

Immediate post op or reduction was excellent (2 mm or less of residual incongruity) in 19 patients and satisfactory (2 to 5 mm incongruity) in 5. At 6 month three patients (21.5%) showed some loss of reduction. One of these was type II, one was type V and one was type VI. Loss of reduction was commoner in older patients.

Table 3-
Quality of Reduction in depressed plateau fractures

	Postoperatively	At 6 Weeks	At 6 months	At12 Months
Excellent (2mm or less)	9	9	7	7
Satisfactory (2 to 5 mm)	5	4	6	6
Poor (> 5mm)	0	1	1	1

Union was achieved in all cases. Union was assessed clinically by stability without pain, under stress without support and radiographically by evidence of bridging callus. The average time of union was 16.7 weeks.

There were 2 superficial wound infections which responded to antibiotic treatment and local dressings. Two patients developed persistent serous discharge from the cortical window site. Repeated cultures were reported to be sterile and both healed within 3 weeks. One patient developed deep wound infection and gross of reduction.

Using Rasmussen's functional criteria 38% of the patients had excellent 50% good, 8% fair and 4% poor outcome. Overall 88% had satisfactory result. the median Rasumussen score was 24 at 12 month.

Table 4 -

Distribution of functional results as per fracture type

			Acceptable		**Unacceptable**
Type	Total	Excellent	Good	Fair	Poor
II	9	4	5	0	0
III	5	2	3	0	0
V	8	2	4	1	0
VI	2	0	1	1	1
	24	**9**	**12**	**2**	**1**

The results were good or excellent in 88% of the patients at 12 months.

Discussion :

Management of displaced tibial plateau fractures by plaster cast immobilization often lead to fracture displacement and eventuallyan unsatisfactory result. On the other hand, traditional form of open reduction and internal fixation with bone grafting has a high incidence of soft tissue problems. Minimally invasive techniques with use of

calcium hydroxyappatite fall in between these two methods of management.

24 patients with depressed tibial plateau fractures were treated operatively by minimally invasive surgery and calcium Hydroxyapatite with aim to preserve biology of fractures. Of 24 patients treated by minimal invasive surgery and calcium Hydroxyapatite 38% had excellent and 50% good result.

Modified Calcium Hydroxyapatite blocks were used as a bone graft substitute to fill the metaphyseal defect in depressed fractures. The filling agent should satisfy certain requisites, most of which are met by calcium hydroxyapatite. First, the filling agent should be readily available in adequate volume. any block or granule size of the hydroxyapatite can be provided. Second, it should be easily contoured to the dimensions of the defect. Although brittle in its mechanical properties, calcium hydroxyapatite can still be fashioned with a rongeur or scalpel into nay three dimensional configuration. Residual bony recesses are easily filled with granules or small fragments of the hydroxyapatite. Third, the grafting material should have sufficient mechanical strength to withstand the compressive loads to which the subchondral bone of the tibial plateau is subjected. While calcium hydroxyapatite has less energy absorption capacity than cancellous bone, its ultimate strength 12 months after implantation has been found to equal or surpass that of cancellous bone, its ultimate strength 12 months after implantation has been found to equal or surpass that of cancellous graft at similar periods following implantation. Finally, any filling agent should permit rapid bone ingrowth and ideally should be replaced entirely by regenerated bone. Calcium hydroxyapatite is an excellent osteoconductive scaffolding for bone ingrowth although its biodegradation occurs at exceeding slow pace. Bucholz-RW reported no significant difference in their series of 40 depressed tibial plateau fractures supported either with cancellous bone graft or interporous hydroxyapatite reviewed at 1 year. Gossling and Peterson used split or whole fibular head to fill the subchondral defect in depressed tibial plateau fractures and reported some loss of reduction in 28% of the cases. Using Rasmussen's functional criteria 38% of the patients had excellent, 50% had good, 8% had fair and 4% had poor outcome. Overall 88% had satisfactory result.

The median rasmussen score was 24 at 12 month. Drennan et al reported 85% satisfactory result in 61 patients treated by close reduction and spica cast application. Touliatos et al reported 84% acceptable result with open reduction and internal fixation in 49 tibial plateau fractures. Schatzker et al obtained 78% and 58% acceptable result in those treated operatively and nonoperatively respectively.

Koval KJ Sanders R reported good to excellent result in all of their 20 patients with unicondylar tibial plateau fracture fixed with percutaneously placed 6.5 mm CCS.. Keogh P. Kelly C reported similar results in their series of 13 patients.

Findings of our study suggest that stabilizing tibial plateau fractures using minimally invasive techniques and calcium hydroxyapatite is definitely advantageous over conventional open techniques. We have used indirect reduction techniques and calcium Hydroxyapatite as a filler substance.

Stable anatomic reduction can be achieved allowing early mobilization, which is the prerequisites for an optimal result. As suggested by Younger and Chapman Modified Calcium Hydroxyapatite is a useful alternative to bone grafting in depressed tibial plateau fractures, its ability to maintain articular reduction in response to an axial load is comparable to cancellous bone grafts. It exhibits the proper porosity to allow for osteoblastic ingrowth to achieve effective bone hearling (osteoconductive). It is gradually incorporated in surrounding bone.

Use of Calcium Hydroxyapatite as a bone substitute along with minimal invasive surgery can be recommednded for the treatment of depressed tibial plateau fractures as it gives 88% good to excellent results with minimal complications. It avoids all the donor site morbidity associated with bone grafting.

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EVALUATION OF GAIT PATTERN IN TREATED CASES OF CONGENITAL TALIPES EQUINOVARUS BY COMPUTED DYNOGRAPHY

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Abstract

Club foot is a bony deformity characterized by inversion, adduction and equinus. Currently evaluation of children treated for congenital talipes equinovarus (CTEV) includes clinical and radiological examination as well as assessment of function, level of pain and patient satisfaction. However none of the methods is ideal. There should be objective methods of assessment of function in treated CTEV. Gait analysis is the new emerging method in objectively assessing the functional outcome. The aim of the study was to compare the selected measures from vertical ground reaction force variables and gait parameters of treated CTEV children to a normal healthy age and gender matched control group. This study showed that gait pattern characteristics and may be helpful in evaluation and further development of treatment of patients with clubfoot.

We compared 31 children with treated CTEV (9 girls and 22 boys) with mean age 8.21 yrs. with 31 age and gender matched controls. All the patients were initially treated under a standard protocol. Gait cycle properties, step time parameters and VGRF variables were recorded and comparison was done between unilateral and bilateral cases of treated CTEV with that of controls. Ultraflex (Gait analysis system) by Infotronics Medical Industrial Engineering was used for data collection.

The data showed that despite good clinical results and overall function residual intoeing, mild foot drop, loss of plantar flexor power, increased frequency and decreased duration of cycle were the main characteristics of gait of children with treated CTEV. In unilateral cases single and double support times were decreased and in bilateral CTEV double support times are increased. Symmetry was found to be disturbed in unilateral CTEV patients.

The current study confirms that in clubfoot patients who have undergone full treatment and not awaiting any further treatment, gait parameters do not reach normal levels. Thus gait analysis can be used to quantify gait pattern characteristics and may be helpful in evaluation and further development of treatment of patients with clubfoot.

Gait analysis, Kinematics, vertical ground reaction forces.

Introduction

Club foot is a deformity characterized by inversion, adduction and equinus. It causes disability either from original deformity or from secondary problems associated with treatment (1) After early conservative or surgical treatment, clubfoot children are periodically reviewed and reassessed. Evaluation of children treated for CTEV includes clinical and radiological examination as well as assessment of function, level of pain and patient satisfaction (1,2) Functional assessment is usually based on questionnaires and does not include objective measurements of performance of foot during gait or other physical activities. As a result, the indications for further treatment as well as good functional outcome are not clearly defined. (1,2,3,4)

Several studies have been done to assess objectively the functional outcome of children treated fo CTEV using gait analysis. But only limited aspects of gait analysis have been covered. (1,2) To our knowledge no previous study has compared the functional performance in children with treated CTEV and a good clinical result with that of normal children. This study will try to set an objective standard for the optimal funcion in treated CTEV.

It was hypothesized that 'There would be no significant difference between normal individuals and CTEV children for gait parameters and vertical ground reaction forces"

The aim of the study was to compare the selected measures from vertical ground reaction froce variables and gait parameters of treated CTEV children to a normal healthy age and gender matched control group.

Material and methods

Patients with previous surgical treatment of CTEV are usually followed up until skeletal maturity at our hospital at CTEV clinic. Patients between ages of 6 and 12 years who had previous conservative or surgical treatment for CTEV and were not awaiting any further treatment were invited to participate in the study. A total of 33 patient were recruited consecutively through the clinic and informed consent for participation in the study was obtained from their parents or their carers. The local ethics committee granted approval for the study.

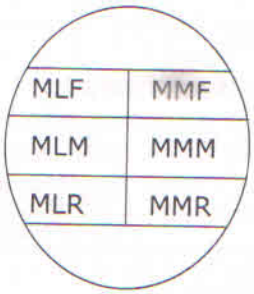
Two patients were excluded from the study because of insufficient data from their gait analysis, leaving 31 children in the study. There were 9 girls and 22 boys with a mean age of 8.21 yrs.which 19 patients with unilateral CTEV 11 were left side and 8 were right sided. There were 12 patients of bilateral CTEV where we studied only the more severely affected foot.

All the patients were treated under a standard protocol. Treatment included serial manipulation and casting upto the age of 3 to 6 months by Ponseti method. Then patients were assessed clinically and radiologically. If there was no improvement, surgery was planned. In case of improvement, casts were continued weekly. After application of final cast for 3 weeks, patient was put on a modified Dennis Brown bar with shoes attached at 70 degree external rotation. Of the 31 patients with club feet, 18 patients were treated with serial manipulations and plaster casts and 13 patients underwent surgery. The operation undertaken was a step wise release of the posterior, medial and lateral foot as required. The cincinnati incision was used. Post operatively molded plaster casts were applied for 2-3 months. Night splintage and the CTEV shoes were continued thereafter. 31 normal control children who were age and sex matched

were recruited from out patient clinics. They were not known to have any musculoskeletal or neurological abnormalities.

Gait analysis : Ultraflex (Gait analysis system) by Infotronics Medical Industrial Engineering was used for data collection (14). Ultraflex is a portable modular programmable system with 16 channels. It has CDG - Computer dynography. The complete ultraflex gait analysis system consists of following parts :

1. CDG shoes with sensors - CDG shoes are designed to measure and record the normal forces under foot while waking. Each shoe contains 8 load sensors at sole. Cables attached to sole transfer the normal forces data to Ultraflex unit for recording.



MMF - Midsole Medial Front
MLF - Midsole Lateral Front
MMM - Midsole Medial Middle
MLM - Midsole Lateral Middle
MMR - Midsole Medial Rear
MLR - Midsole Lateral Rear

2. Measurment unit - Ultraflex unit is a portable measurement unit that records normal ground reaction forces while wlaking. All measurements will be stored in the memory card while conducting the new measurement.
3. Ultraflex Optical link cable - The main function of the ultraflex optical link cable is glass fiber cable for high speed transfer.
4. Cords - Used to connect ultraflex measurement unit to the computer used for data analysis.
5. Starps - Used to fix the cord with the body so that the patients have no problem in walking.

Methods of Data Collection

Each subject was made to wrap an ultraflex unit around the waist and a pair of CDG shoes of approximate size was put on foot. The subjects were then given 2 minutes of familiarization time. After the familiarization time the subject were made to walk at natural speed straight on a ten meter corridor. Data was then taken for 20 seconds. The recorded data was then transferred to processor by link cables. Data analysis was done from fifth to fifteenth second of gait as it was supposed to represent natural gait pattern.

Gait parameters and vertical ground reaction forces assessment is done by measuring the following data -

1. Gait Cycle properties - Gait cycle duration, frequency, symmetry.
2. Step time Parameters - Single support Time, Double support time, Stance time,
   Step time and Single swing time.
3. Vertical Ground Reaction forces variables and force graphics - Heel on Mid stance and Toe off.

Data reduction and analysis -

All data was reduced to mean pressure in each sensor by the software in the CDG. Only step time parameter and vertical ground reaction forces measures obtained by force graphics and histogram are meticulously noted. Now, mean of each group of data is calculated and comparisons done. For statistical significance 't' value and 'p' value

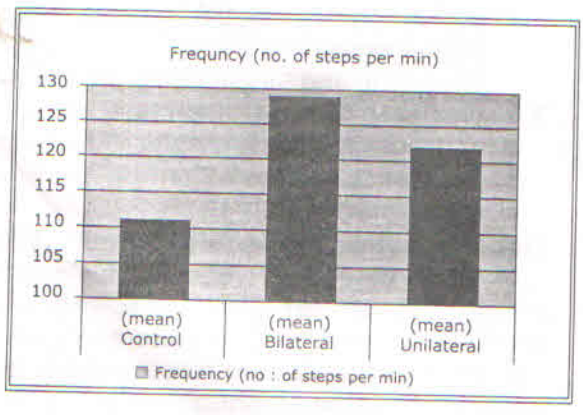
calculated. Change is considered significant if "p" value is <.o5

Results

All data was noted and comparisons done between affected limbs of unilateral CTEV, more severely affected limb of bilateral CTEV and normal limb of unilateral CTEV with that of controls. This was done on the basis of gait cycle properties , step time parameters and VGRF variables obtained by histogram and force graphics. We observed that gait of patients of treated CTEV patients is apparently similar to control subjects, but significant difference were observed on analysis of various gait parameters using CDG.

1) Gait cycle properties -

a. Frequency - increased in both bilateral and unilateral cases
b. cycle duration - decreased in both bilateral and unilateral cases
c. symmetry - mainly disturbed in unilateral cases



- Center of gravity is shifted towards affected side in unilateral CTEV. Center of pressure is shifted laterally in the affected foot.
- Vertical ground reaction forces were mainly present over lateral border of foot. This finding was consistent in both unilateral and bilateral CTEV patients.

3) Step time parameters -

a. comparison of step time parameters of affected limb of unilateral CTEV with control group

Step Time Parameter	Control (mean)(sec)	Unilateral (mean)(sec)
Single Support Time	0.348	0.321
Double Support Time	0.131	0.129
Stance Time	0.671	0.599
Step Time	0.716	0.450
Single swing Time	0.416	0.363

b. Comparison of step time parameters of more severely affected limb of bilateral CTEV with control group.

Step Time Parameter	Control (mean)(sec)	Bilateral (mean)(sec)
Single Support Time	0.348	0.279
Double Support Time	0.131	0.170
Stance Time	0.671	0.591
Step Time	0.716	0.445
Single swing Time	0.416	0.354

c. Comparison of step time parameters of affected limb of unilateral CTEV with normal limb of unilateral CTEV.

Step Time Parameter	Unilateral notmal Side (mean)(sec)	Unilateral affected Side (mean)(sec)
Single Support Time	0.358	0.321
Double Support Time	0.146	0.129
Stance Time	0.638	0.599
Step Time	0.51	0.45
Single swing Time	0.399	0.363

Discussion

The results of CTEV surgery have traditionally been assessed using radiographic techniques and measures of range of motion, yet the passive mobility of foot and ankle has little bearing on the ability of the patient to walk and run without pain. functional measures of outcome started with Otis and Bohne in 1986 (6,9) who assessed the results of clubfoot surgery with gait analysis measuring cadence parameters and gathering EMG data. Aronson and Puskarich (7,9) studied the centre of pressure in treated cases of clubfeet and found that the centre of gravity gets shifted towards lateral side of foot in clubfeet as compared to controls. Our study also shows similar findings. The values of vertical of vertical ground forces were more on MLF, MLM and MLR in club feet as compared to controls as shown by the histogram.

The force generated during mid stance phase was less than control subjects (both in unilateral and bilateral CTEV patients. (average in control group - 197 N, in unilateral CTEV 119 N, Bilateral CTEV 134 N). This implies that dorsiflexor power is weak that is tibialis anterior power is weak which leads to intoging. This is supported by Asperheim et. Al (8), who observed abnormal stance phase activity of anterior tibialis on EMG, referred for residual intoeing after clubfoot release (5). Karol et. Al (9,10) also observed residual intoeing during his study of gait analysis of treated Clubfeet.

Karol et al (9,10) analyzed the gait of treated clubfeet patients. He observed reduced strength of plantar flexors, quadriceps weakness. Alkjaer et al (11) studied nine adult patients with treated CTEV using video and force plates. During his study subjects were asked to walk across two force platforms at a speed of 4.5 km/hr. Fifteen small reflecting spherical markers were placed on subjects. Five video cameras were used to record findings. They found weakness of plantar flexors. Patients with a good clinical result and evaluated by an established protocol were not included in any of these studies. Neither did they record any quantitative data. Our study supports the findings with the help of quantitative data. During push off phase, power generated in affected foot is significantly reduced in the CTEV group (avg. in unilateral- 175 N, avg. in bilateral 195N, avg. in controls-252N). This implies that the normal forces exerted at the heelp by the plantar flexors arereduced. This supports minor foot drop observed in treated CTEV patients.

Davies et al (10) studying children with treated CTEV (both unilateral and bilateral) compared them with normal and age-matched children. They found weak ankle plantar flexors and reduced range of movement of the ankle. Furthermore, they detected abnormal moments around the knees and hips which they attributed to the abnormalities of the ankle and foot.

Distribution of ground reaction forces over & sensors was recorded during gait. Forces were mainly distributed along the lateral border of the foot. Davies et al (12) found that lateral ground reaction forces in children with clubfoot was greater than that of normal children. Aronson and puskarich (7) found increased stress along the fifth metatersal whereas widhe and Berggren (13) showed a shift towards the lateral. The inversion angle evident at the ankle indicated a possible residual inversion deformity of the foot, which caused lateral border walking.

Anterior ground reaction force was found to be weak which implies lack of push off that is weak plantar flexor activity.

All the tiems are reduced in both unilateral and bilateral cases except double support time which is increased in bilateral cases. Step time parameters of normal limb of unilateral CTEV are also abnormal showing that they may have compensated for the insufficient motion.

3. Comparison of **Vertical ground reaction forces** over each sensor of more affected limb of Bilateral CTEV group with unilateral CTEV & Control group.

Sensors	Control (mean) (N)	Unilateral(mean) (N)	Bilateral(mean) (N)
Toe	55	17.5	13
MMF	44	22	25
MLF	40.5	55	50
MMM	42	19.5	24
MLM	15	93	107
MMR	51.5	7.5	8
MLR	62.5	98.5	87
Heel	22	14	17

In both unilateral and bilateral CTEV forces are mainly distributed along the lateral border of foot. Forces over MLF, MLM and MLR are increased while over other sensors forces are decreased.

4. Force Graphics

Amplitude N	Control	Unilateral	Bilateral
Heel On	238	177	170
Mid Stance	197	119	134
Toe Off	252	178	195

Time (ms)	Control	Unilateral	Bilateral
Heel On	126	82	90
Mid Stance	245	282	277
Toe Off	404	351.5	347

Power generated during all the three phases of stance phase is less than controls in both unilateral and bilateral club foot patients. But the duration of mid stance phase is more as compared to controls. This shows that patient faces difficulty in maintaining balance and takes more time in stabilizing the affected foot on ground.

Findings of cyclogram and histogram showed that in unilateral CTEV patients centre of gravity is shifted towards affected side. Mean values of symmetry was disturbed more in unilateral club foot patients. (0.98 in unilateral as compared to 1.01 in bilateral and 1.009 in controls)

Comparison of step time parameters was done between normal foot of unilateral CTEV with that of affected foot and also with control subjects. Step time parameters in normal foot of unilateral CTEV were abnormal. This shows that the contra lateral limb in unilateral CTEV is not normal and have compensated for the insufficient motion of the Clubfoot. Davies et al (12) analyzed the gait of unilateral CTEV and found abnormal kinematics of unaffected limb when compared to controls.Therefore he suggested that the kinetics and strength of the contralateral limbj of children with unilateral clubfoot and that of normal children should also be compared. Our findings suport this study.

Frequency measured denotes that walking ability is reduced CTEV patients that is the number of steps/ min was increased. Duration of gait cycle was found to be reduced. In unilateral cases single and double support times were decreased showing that the child hesitated in keeping the affected limb on ground and most of the time keeps his

affected limb off the ground. In bilateral CTEV double support times are increased which shows that when patient bears weight on affected side, the contra lateral limb also supports it. Symmetry was found to be disturbed in unilateral CTEV patients. This is supported by the fact that they try to put most of the load on the normal limb.

The current study confirms that in clubfoot patients who have undergone full treatment and not awaiting any further treatment, gaitj parameters do not reach normal levels. Despite good clinical results and overall function residual intoeting, mild foot drop, loss of plantar flexor power, increased frequency and decreased duration of cycle were the main characteristics of gait of children with treated CTEV (2,3,9)

Unilateral CTEV patients favoured their affected limb by not putting as much force on it. This results in additional stress on unaffected leg and may lead to development of osteoarth ritis and joint problems in later years.

We have not compared gait of conservative us. operatively treated CTEV because initial grade of severity of clubfoot during start of treatment has not been taken into account. Of course more severe grades must have been treated operatively. This was a limitation of our study.

Strength training is not generally included in the treatment of club foot subjects (11). It is possible that strength training of plantar flexors in the club foot group would enable them to walk with a larger ankle moment, reducing the loads on the knee and hip joints.

Revision surgery in clubfeet should only be done when the problem of loss of deformity has become unacceptably symptomatic producing functional problems and pain. It should always be remembered that repeated surgery will always produce additional stiffness within the foot and further loss of power (15).j Thus there should be objective methods of assessment of function in treated CTEV. Early methods like radiology and clinical evaluation have limitations. Gait analysis is the new emerging method in objectively assessing the functional outcome. This study showed that gait analysis including kinematics and dynamics of walking can be used to quantify gait pattern characteristics and may be helpful in evaluation and further development o ftreatment of patients with clubfoot.

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FROM FUSION TO MOTION: EARLY EXPERIENCE WITH CERVICAL DISC REPLACEMENT

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**** Dr Manish maheshwari

Introduction:

Anterior cervical decompression and fusion is the standard treatment of choice for cervical disc prolapse. It has very good results in terms of symptomatic relief and stability of the spine but at the same time it is associated with incidence of Adjacent Segment Disease[1,2], graft site morbidity (Autograft), possibility for disease transmission(allograft) as well as increased period of recovery. Kulkarni, et al[3] reported a magnetic resonance imaging short term follow-up study conducted after cervical corpectomy and fusion. Accelerated spondylotic changes adjacent to the fused segment were recognized in 75% of the 44 patients studied.

Cervical Disc Replacement is an exciting and rapidly progressing option for treatment of cervical disk prolapsed with radiculopathy[4]. Cervical disc arthroplasty has potential benefits of, significantly reduced incidence of Adjacent Disc Disease, it maintains normal neck mobility as well as stability, reduce graft site morbidity, and decreased recovery period[5].

The purpose of this study is to evaluate the alternative method to fusion in cervical spine and to assess early neck mobility and stability after Cervical Disc Replacement.

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Material and Methods:

Four patients underwent Cervical Disc Replacement between May to July 2007. All surgeries were performed by a single surgeon using PRESTIGE LP metal on metal cervical disc (Medtronic).

Inclusion and exclusion criteria

Inclusion criteria consisted of cervical disc disease, defined as an intractable radiculopathy or myelopathy caused by neuroradiologically documented disc herniation. Only patients with single-level disease in C4-5 to C6-7,unresponsiveness to nonoperative treatment for approximately 6 weeks, or the presence of progressive symptoms or signs of nerve root compression while on conservative treatment were included. Neck Disability Index (NDI) score was calculated pre and postoperatively. Patients had to be older than 18 years of age and the preoperative NDI score had to be higher than 30. We excluded patients with previous surgical treatment of the cervical spine. Patients with osteoporosis, osteomalacia, osteopenia or cancer were also excluded.

In our study all patients had sensory deficit and one patient had motor deficit. Two cases had disc prolapse at C5-C6 level and two at C6-C7 level. All patients were young active male patients in the age group 30-40 years. Two patients had adjacent degenerative discs. All the patients were explained about the artificial cervical disc. Approval was obtained by the ethics committee of the hospital. No post-operative immobilization was done except intermittent use of soft cervical collar.

Follow-Up Procedures

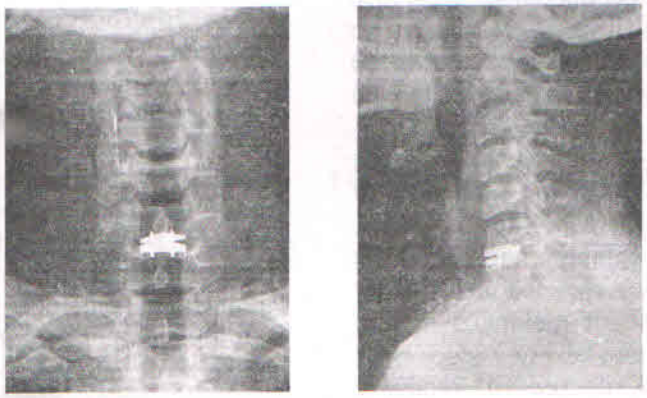
All the four patients were available for follow-up. Follow-up evaluations were assessed by a single clinician who was directly inloved in the study. Patients were followed up at 6 weeks, 3 months and 6 months postsurgery and assessed clinically by actual neck movements, chiefly flexion and extension, radiologically by X-Rays and neck movements were checked under image intensifier. Patients were also assessed post-operatively by calculation of Neck Disability Index (NDI).

Neck disability index

The neck disability index is a questionnaire containing 10 questions that is used to measure cervical pain and disability associated with activities of daily living. A lower score on the NDI represents less neck pain and disability. The NDI questionnaire was administered preoperatively and at each postoperative interval. At all postoperative intervals patients showed significant improvement from the preoperative scores.

Results:

All the patients had immediate relief in neck pain and radiculopathy, numbness improved within 2 weeks time, were able to do good neck movements on 3rd postsurgery day and almost full range of movements within 2 weeks. Motor power also improved in 2 weeks in case of one patient who had motor involvement preoperatively. The NDI Score improved by more than 50%(in the range of 15-24 i.e. moderate disability) in all four patients at the end of 2 weeks and at 3 and 6 months the NDI Score was in the range of 5-14 i.e. mild disability.



X-Ray showing artificial cervical disc

Table 1. Summary of data in patients in whom cervical discreplacement was done.

Case	Age/Sex	Indication	Preop NDI Score	Post op NDI Score at weeks	Post op NDI Score at 3 months	Post op NDI Score at 6 month
1	37 yr/M	PIVD C5-6, LT radiculopathy	43/50	21/50	11/50	09/50
2	39 yr/M	PIVD C6-7, LT Radiculopathy	46/50	17/50	09/50	06/50
3	40 yr/M	PIVDC 6-7, RT Radiculopathy.	40/50	23/50	13/50	10/50
4	34 yr/M	PIVD C5-6, RT Radiculopathy.	38/50	21/50	08/50	05/50

Discussion:

Despite being far from an accepted standard, the concept of cervical disc replacement is gradually becoming a reality. The possibility of being able to maintain motion in cervical spine and there by minimize the adjacent-segment degeneration is exciting[6,7]. Biomechanical studies have shown that a disc replacement create less adjacent-level strain then fusion and decreases the motion of the adjacent levels compared with fusion[8]. Most spine surgeons agree that an anterior cervical discectomy and fusion is among the most reliable and successful procedures they have to offer their patients. On the other hand surgeons are becoming aware about the effect of fusion on adjacent segment.

Because the results of anterior fusion are very satisfying it will be difficult to prove short term superiority of cervical arthroplasty. The long term benefits cannot be assessed before several years of observation. Intermediate and long term studies are necessary to prove superiority or equality to the current standard of anterior cervical decompression and fusion[9].

Conclusions:

Nonfusion technologies have evolved to obviate the morbidity associated with spinal fusion procedures. These include both short term and long term morbidities like donor site pain, psuedoarthosis and adjacent segment degeneration. Disc replacements tend to preserve motion and address anterior column pathology. Non fusion technology will be needed as we face younger population. At the same time we have to evaluate long term superiority of nonfusion over fusion procedures.

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CAUDAL EPIDURAL STEROID INJECTIONS FOR LOW BACK PAIN
[STUDY OF 150 CASES]

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Abstract

Most low back pain can be treated without surgery. Epidural Steroid Injections is the simple, economic mangement of Low back pain. which is suitable to the Indian setup. 150 patients were given ESI Depomedrol through caudal route. Observations were made to evaluate the success rate by 67% in this small series at R.D. Gardi Medical College, Ujjain.

Keywords Epidural Steroid Injection [ESI], Low Back Pain [L.B.P.], Caudal Block

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Introduction

If you have a LBP, you are not alone. Nearly everyone at some point has back pain that interfere with work, routine daily activities or recreation-the mankind has to pay for upright position. Americans spend at least 50 billion US dollars on LBP, in terms of job related absenteeism and temporary disability. LBP accounts for nearly 15% of sik leaves for the adults' up to 45 years of age. Fortunately, most occurrences of LBP go away with in a few days, others take much longer to resolve or lead to more serious conditions. After 12 week of period it is termed chronic. The natural history of LBP is reported to be self limited and have a favourable prognosis, if intervened non surgically invariably by means of ESI improves symptoms by resolution of inflammation around nerve roots as steroid is potent anti-inflammatory in nature, when given in early weeks of onset of pain. The bolus amount of the injections physically decompress the roots by pushing the pultaceous prolapsed soft disc. ESI, analgesics, change of personal habits, use of lumbosacral belts and physical therapy has brought relief to many patients by avoiding spine surgery.

Material and Method

The patients attending the SPINE CLINIC of RDGMC, Ujjain were recorded and selected by exclusion for ESI. The patient having LBP and relieved by L-S traction, analgesics and relaxants were excluded from the study, rest were thoroughly investigated for diabetes, anaemia, tuberculosis, HIV and malignancy, then subjected to undergo ESI once a week for consecutive three weeks. After xylocaine sensitivity test empty stomach LBP patients were taken operation theatre on prone position with a pillow beneath the abdomen to obliterate the lumbar lordosis and abjucted hips to relax the glutei. After all aseptic precautions a round opening drape kept over the sacrum and coccyx. Sacral hiatus is identified by prominent projection of sacral cornu on either side of it. Sacral hiatus is a triangular opening with its apex in the midline proximally. Alternatively, the finger tip is kept over the coccyx and brought proximally upwards, the depression is blocked by the sacral hiatus. After this identification, a 22 gauge-2.5 inches long needle was passed through hiatus semilunaris in the epidural space the needle is joined to the 30 cc syring containing 10 ml of 2% xylocaine, 10 ml of normal saline, 2ml of depomedrol containing 80 mg of methylprednisone and vial of inject hylase. In some cases the position of the needle was confirmed by C-arm image intensifier. This avoids the dural puncture also.

Evaluation done by wong Bacter faces pain rating scale pre-&post injection screres.

OBSERVAITONS

Total 150 cases selected for epidural steroid injection. The age of patients was ranging from 11 years to 70 years.

Majority of cases (57) were between 31-40 years.

Table-1, Age Icidence

Age	No. of Patients
00-10	NIL
11-20	04
21-30	30
31-40	57
41-50	33
51-60	15
61-70	11

Maximum 57 patients were in the age group of 31-40 yrs. [35%]

TABLE -2, SEX INCIDNECE

TOTAL NO. OF PATIENTS	MALE	FEMALE
150	88	62

Out of 150 cases 88; were males (58.66%)

TABLE-3, OCCUPATION OF PATIENTS

OCCUPATION	NO. OF PATIENTS
HOUSEWIFE	50
LABOURER	34
AGRICULTURE	34
SEDENTARY WORKERS	32
TOTAL	150

Majority of patients 50 out of 150 were housewives.

RESULTS

Wong Baker faces pain rating scale was used before and after the epidural steroid injection.

Face 0 - is very happy because, he does not hurt at all.	
Face 1 - hurts a little bit	
Face 2 - hurts a little more.	
Face 3 - hurts even more.	
Face 4 - hurts a whole lot.	
Face 5 - hurts as much as you can imagine.	

Wong Baker faces pain rating scale -

Wong Baker faces pain rating scale -	Before caudal block- no. of patients and	After caudal block no. of patients and %
Face 0	0 (0%)	45 (30%)
Face 1	5 (3.33%)	55 (36.66%)
Face 2	10 (6.66%)	30 (20%)
Face 3	25 (16.66%)	10 (6.6%)
Face 4	60 (40%)	5 (3.33%)
Face 5	50 (33.33%)	5 (3.33%)

FOLLOW UP-FACES/DURATION/NO. OF PATIENTS

FACE DURATION	0	1	2	3	4	5
Next Day	45	55	30	10	5	5
1 Week	40	50	35	10	10	5
4 Weeks	40	55	40	10	10	5
6 Months	35	45	40	10	10	10
1 Year	30	40	50	10	10	10

DISCUSSION

Steroids are potent anti-inflammatory agents. methyl-prednisilone (Depomedrol) is a poorly soluble form of steroid that inhibits the substance-P, PLA-2, arachidonic acid, TNF-alpha, IL-1 Prostaglandins and immunological meditors of pain. It also acts by reducing the activity of immune system to react to inflammation associated with nerved tissue damage. It shrink the swelling of herniated disc thereby reducing the size of prolapsed tissue, in term the relief of pressure over the nerve roots. Overall pain relief is effective by decreasing the nerve root irritation. No systemic side-effects ere observed as it was not repeated more than three times in a year. Lidocaine is a fast short acting anaesthetic drug provide temporary numbeness of nerve root.

Normal saline is used to dilute the local lidocaine and as a volume with physically flush away the soft disc in place. Injection Hylase (Hyaluronidase) enhances the action of local anaesthetic by increasing the absorption of drug.

The overall 67% good to excellent relief of pain is a good indication ofuse of ESI through caudal route by Depomedrol, in our study, it has shown that 33% poor results are due to the severety of disc prolapse with calcification and osteophyte formation around the existing nerve roots.

In other series of Manchikanti (2001) the results were 80% excellent, comparing to the work shown by Bogduk (1995-2004). White (1980) gave the details account of LBP for diagnosis as well as for treatment. Dreyfuss (1993) suggested the significance of fluoroscopy for caudal ESI. Yin & Gilula (2000) did a randomized control study to evaluate the efficacy in nerve root injections in limber radicular pain . interventional spinal injections guadelines direct to use the ESI as a diagnostic & therapeutic tool for LBP before surgery.

one case had post caudal block infection at the site of needle puncture , relieved by antibiotics. Another case had a dural puncture with CSF leak ; lend up with headache, relieved by analgesics.

CONCLUSION

We conclude the ESI is a non-surgical, effective, common, safe technique for LBP management and if not relieved these may be switched over to surgical procedures, without harm.

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Sacrococcygeal chordoma :- A Rare Bone Tumor

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ABSTRACT

Presenting a case of 50 Years male with Sacrococcygeal Chordoma with low back pain, Swelling in Sacrococcygeal region which was then manage by wide excision of tumor mass and removal of Sacrum and Coccyx by posterior approach.

Case summary

50 Years male Patient farmer by profession, patient came with compliant of low back pain since 6 months and painless swelling over sacral region since 3 months which was gradually increasing in size. He also had complains of constipation and perianal hypoesthesia. On clinical examination swelling was of 15x10 cms. variegated consistencey non tender and skin overling swelling was adherent to it. His x-ray of sacrococcygeal region was done which revealed destructive lesion of sacrum and coccyx. MRI of Sacrococcygeal region revealed destruction of S-2 vertebra & soft tissue involvement.

So his biopsy was done which suggested of Chordoma.

Patient was prepared for surgery explaining about Pgognosis. Through posterior approach in prone position tumor was excised with wide margins and it was sent for histopathology examination, Patients bowel, bladder sensations were intact and there was no neurological detoriation.

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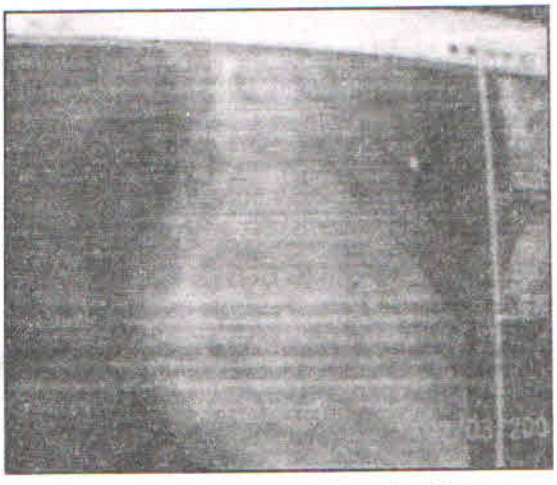
Discussion :

Chordoma is a rare malignant neoplasm that arises from notochord remnants. It is most common primary malignancy of sacrum and second most common primary malignancy of spine. It accounts for 4-5% of tumors of bones. Age of presentation is 4th - 7th decade, male : female ratio is 3:1. Sacrococcygeal Chordoma is most common occures in 50-70% cases, other sites of involuement are base of skull, cervical spine. Presenting symptoms are low back pain, bowel and bladder disturbance, sciatic pain on clinical examination Palpable mass is felt. Radiologically Chordoma appear as destructive lesions and arises from midline, better seen in lateral view with bowel preparation.

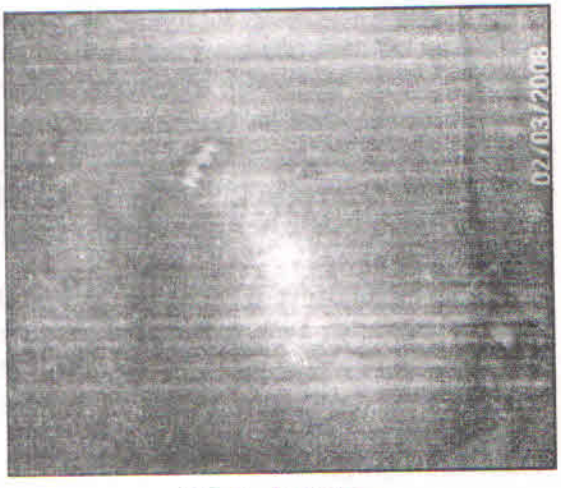
CT & MRI helps in detecting calcification and relationship between other anatomical structures. On Microscopic examination Chordoma appears as lobules of cells separated by fibrous bands, the cells contain more amount of vacuolated cytoplasm, the cells are arranged in long strands or chords with mucinous background. The primary treatment is surgical resection with wide margins even if it creates a neurological deficit because progressive growth of tumor will create a neurological deficit and metstatic desease Chemotherapy is having no role in treatment, post operative radiation has palliative role. The 5 year survival rate is 60-80% and recurrence rate is 25-40%, metastasis occurs to lungs, bones, liver, brain.

Conclusion and Summary :

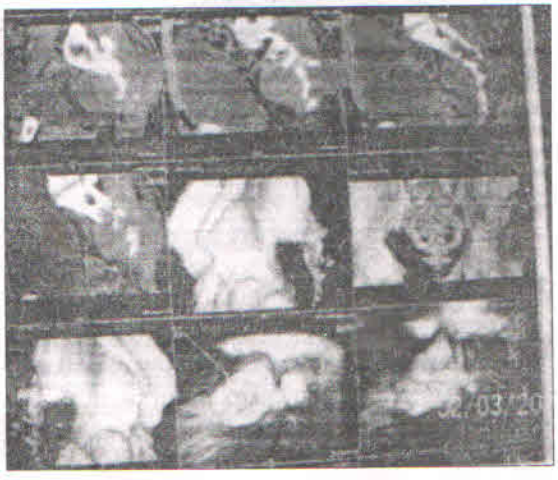
Chordoma must be suspected in cases of low back pain swelling in sacral region, elderly male. biopsy of swelling and MRI are key points in clinching diagnosis. Always Chordoma must be treated by surgical approach and removal of tumor with wide margins excision irrespective of neurological and bowel bladder deficit.



X-ray Features (lat view)



Clinical Picture



CT Scan Findings

X-ray Features AP View

An Intraosseous Lesion of Talus... A Case Report

Dr.Sunil Rajan* **Dr.Laxman Banoda**** **Dr.Deepak Mantri*****

A 39 year old man presented with pain in his left midfoot and lateral side of ankle off and on since about 3-4 years.Pain is sharp stabbing in nature without night crisis or constitutional symptoms,with asymptomatic intervals ranging from 1 month to 3 months.There is no history of trauma.

On Examination:-Gait normal,Distal neurovascular-no abnormality detected.On palpation no tenderness or effusion at ankle.Drawer test and stress test were negative.

Plain Radiograph

Anteroposterior & lateral views of ankle showed about 1.5c.m. diameter lytic lesion in body of talus slightly on lateral side to midline.Lesion is well defined with thin sclerotic margins.No extension to ankle joint.

Patient was advised M.R.I.scan but could not be done due to financial constraints.

Lateral radiograph of the talus.

Anteroposterior radiograph of the talus

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Differential diagnosis

- Aneurysmal bone cyst
- Simple bone cyst
- Giant cell tumour
- Unicameral bone cyst
- Ganglion cyst

Plan of treatment

Incisional biopsy was planned,s o s curettage bone grafting of defect.

Approach:-Anterolateral incision

Intraoperative exposure of the cyst in the talus is obtained using an anterolateral approach.

Intraoperative finding

Contained within the osseous space was a gelatinous,inspissated yellow fluid which was sent for histopathological examination.

Histopathological diagnosis:-Intraosseous Ganglion

DISCUSSION

The term intraosseous ganglion, first described by Hicks as a juxtaarticular bone cyst filled with mucoid fluid encountered most often in middle aged patients with slight male predilection. The distal tibia and fibula are the most frequent sites of involvement with the talus involved in 3% to 12% as reported in several large series Pain is an inconsistent precursor occurring in approximately 1/2 of patients and associated trauma is infrequent.

Intraosseous ganglia appear as radiolucent subchondral cysts thin uniform rim of sclerotic and are found in. eccentric, subchondral locations within the epiphysis. Their size ranges from 0.5 to 5 cm in diameter.

Both chondroblastomas and osteoblastomas may have well circumscribed sclerotic borders and a radiolucent center however chondroblastomas usually have stippled calcification withinthe chondroid matrix osteoblastomas may exhibit ossification. Intraosseous ganglia are distinguished from degenerative cysts by the absence of arthritic changes of the joint and from pigmented villonodular synovitis because it affects only 1 side of a joint.

Chondromyxiod fibromas and nonossifying fibromas involve the cortex. Unicameral bone cysts are usually metadiaphyseal in long bones Aneurysmal bone cysts show more conspicuious thinning and expansion of adjacent cortex, have surrounding reactive sclerosis, and usually display prominent fluid fluid levels. Giant cell tumors are lucent but lack the reactive bone.

Histologically, intraosseous ganglia cannot be distinguished from soft tissue ganglia. The cyst is filled with a mucinous material that stains positively with periodc acid Schiff. The cystic space is circumscribed by a dense connective tissue membrane that is formed by parallel fascicles of collagen fibers with relatively few fibroblasts.

This patient underwent an incisional biopsy. curettage, and autogenous bone grafting of the defect. An anterolateral incision was used to expose the ankle joint and the lateral aspect of the talus. Post operatively patient responded well to surgory.

GUIDELINES TO AUTHORS

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