

## Role Of Threading Technique As An Alternative To Surgical Excision Of Baker's Cyst In Children

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### Abstract

**Background:** Baker's cyst is synovial swelling, found in the popliteal fossa seen typically in adults. In children, it is relatively rare, which at times may require surgical excision, which has its own morbidity. We evaluated the results of threading technique in children having Baker's cyst.

**Methods:** 6 cases of age less than 15 years with baker's cyst who failed to respond to conservative treatment were treated by our threading and aspiration technique. Ultrasound was used to confirm the diagnosis.

**Results:** 6 male children with mean age of 10 years with failed conservative treatment for mean of 5.5 months were included in study. Mean aspirate of cyst was 12.5 ml and mean time of thread removal was 7.1 day. Swelling of Baker's cyst subsided in all cases in mean time to 6.4 weeks (range 6 to 8 weeks) completely without any recurrence at final follow of 1 year.

**Conclusion:** Threading technique is good alternative to surgical excision in treatment of baker's cyst in children, with advantages of easy, cost effective, low morbidity, day care procedure without loss to school days

**Keywords:** Baker's cyst, synovial cyst, threading technique

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### Introduction

Baker's cyst or Popliteal cyst is a well delineated fluid filled herniated synovial bursa, which is usually located between tendons of medial gastrocnemius and semimembranosus in the posterior aspect of the knee that communicate with the knee joint [1]. It is also known as Marrant Baker cyst based on the name of British Surgeon Dr William Marrant Baker [2]. The cyst is commonly seen in the adult or older age groups with prevalence from 10% to 41% and is comparatively rare in the children with reported incidence from 2.4% to 6.3 % having male preponderance [3,4]. Most of the Baker's cysts are asymptomatic in children because of having no

secondary pathology involved, and hence the treatment of the Baker's cyst in children is usually observation and about 70 % of cases resolve its own with the time in months or years [5]. But in few cases it increases in size to such extent that they become symptomatic and the child may have difficulty in squatting and cross leg sitting. For these symptomatic cyst, which do not resolve with the conservative treatment, surgical excision is recommended with ligature at the neck of bursa [6]. This surgical excision warrants hospitalization, loss of school days and morbidity. In view of this, we evaluated the simple technique of threading, a day care

procedure as an alternative to surgical excision of Baker's cyst in children.

### Material and Method

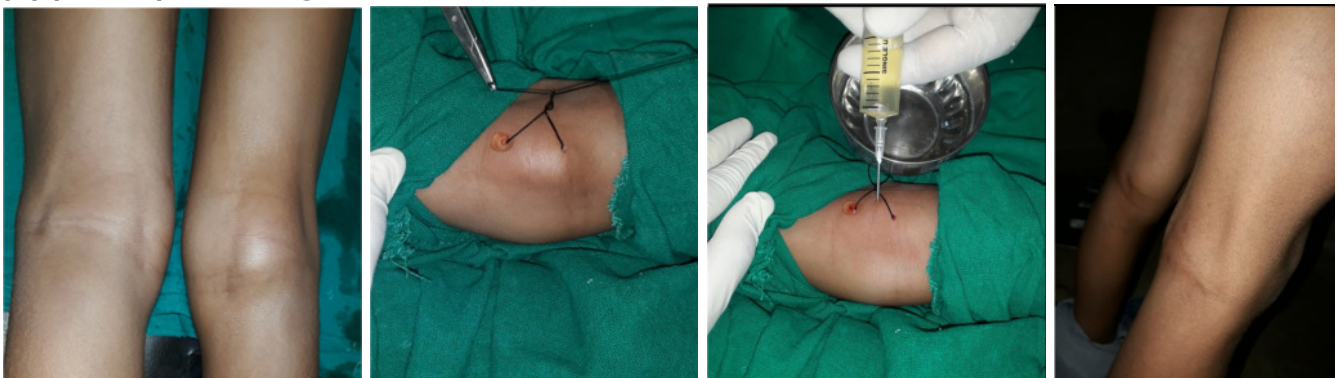
We retrospectively evaluated the results of threading technique of Baker's cyst done at our center. All children with less than 15 years age, with large cystic swelling in the popliteal fossa which was not responded to the conservative treatment in the form of observation and trial of aspiration and corticosteroid injection and which was treated by threading technique were included in study. Patients who were more than 15 year's age and who responded to conservative treatment were excluded.

All children were interrogated for complain of uneasiness in the joint, cosmetically and socially unacceptability of the swelling in posterior aspect of knee. Physical examination was done in prone position in extended knee and 45 degree flexed knee and reducibility of the swelling was also checked. Trans-illumination test was done to differentiate between solid and cystic mass.

Ultrasonography was used to confirm the diagnosis of Baker's cyst and the child guardian were consented for minor procedure.

In prone position, after sterile painting and draping, the cyst was made more prominent by keeping the knee in extension. Initially the cyst was aspirated with 2 ml syringe to reconfirm the Baker's cyst as synovial cyst. After confirmation, Ethicon (number one) was passed longitudinally along the cyst medially protecting the neurovascular structures, which are placed laterally. The thread is tied outside the skin loosely keeping the loop long and free and the ends of suture kept long. Then cyst was then re-evacuated with 20 ml syringe and then sterile dressing was done. The fluid inside the cyst made to drain continuously from the sides of the sutures. Oral antibiotics and analgesics were given for 3 days. Dressing was changed in alternate day and continued till the dressing become dry. The thread was removed under aseptic precaution after the dressing became sterile (fig 1).

**Fig 1 Clinical photograph showing Bakers cyst in left knee (a), threading technique (b), aspiration (c) and follow up (d) of one year showing no recurrence**



### Results

6 children were included in study after fulfilling inclusion criteria. All children were males. The mean age was 10 years (range 6 to 13 years). As per the patients all had uneasiness and for all the swelling was unacceptable cosmetically and socially. Swelling in all children was non reducible with positive trans-illumination test. The patients had received the conservative treatment for mean of 5.5 months (range 4 to 7 months).

Mean aspirate of cyst was 12.5 ml (range from 8 to 14 ml). The mean duration of dressing becoming dry was dressing 5.2 days (3 to 8 days). The mean time of thread removal was 7.1 day (range 6 to 10 days). Swelling of Baker's cyst subsided in all cases in mean time to 6.4 weeks (range 6 to 8 weeks) completely. Children were followed for 1 year with no recurrence. In one patient, there was superficial infection which subsided with antibiotics for one more week.

## Discussion

Pathophysiology involved in Baker's cyst in adults is usually inflammatory or degenerative arthropathy like meniscal disorder (mostly medial meniscus), osteoarthritis, rheumatoid arthritis, villonodular synovitis or following infection [7,8]. But in children, it is usually idiopathic in 95 % of cases affecting, mostly children of 2 to 14 years of age [9,10]. It is also seen in children with hyper laxity joint disorder or juvenile rheumatoid disorder [11,12]. In children, it is also presumed that cyst starts, after trivial trauma to posterior aspect of the knee. There is controversy regarding communication of the cyst with the knee joint [13].

Ultrasonography is the investigation of choice for the diagnosis of the most cases of Baker's cyst although in few cases MRI may be recommended to rule out parameniscal cyst, cystic malignancies like fibrosarcoma, synovial sarcoma, malignant fibrous histiocytoma and popliteal vessel aneurysm which are rarely seen in children and are usually seen in adults [14-16]. Pathogenesis of Baker's cyst depends upon the presence of the valve between the tendons of medial gastrocnemius and semimembranosus muscle which open during flexion of the knee and closes during extension of the knee. There is also pressure variation in the knee from -6 mm Hg during partial flexion to 16 mm Hg during extension [17]. Baker's cyst protects knee joint from high effusion pressure by diverting fluid from knee to Baker's cyst with valve like mechanism that allow flow in only one direction [18]. Treatment of Baker's cyst in adults needs

addressing of the primary pathology for its successful treatment [19]. Excision is recommended when conservative therapy fails. But excision has high rate of recurrence ranging from 5 to 40% and in children it can result in loss of school days due to hospitalization and morbidity. Further, since in children the cyst is mostly of primitive origin only, when the cyst failed to respond to conservative therapy, threading technique can be used. We used this threading technique, in 6 children of baker's cyst as an alternative to surgical excision. In all the cases swelling of Baker's cyst subsided in all cases in mean time to 6.4 weeks completely, without any recurrence when followed till one year. The thread technique along with aspiration, decompress the cyst and with the tract of the thread the cyst is decompressed continuously which needs regular dressing, and in the meantime, the thread causes inflammatory reaction and fibrosis to occurs to seal of the cyst, and hence preventing recurrence. With success our results we can say that the procedure is easy, day care procedure without much morbidity, can be done minimal invasive, cost effective, reliable, without recurrence and with good results. Our study is limited by short sample size.

## Conclusion

Threading technique had shown good results with no recurrence rate as an alternative to surgical excision in treatment of baker's cyst in children, with advantages of easy, cost effective, low morbidity, day care procedure without loss to school days.

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