Femoral Hernia Repair With Mesh-Plug in Children

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Purpose: Femoral hernias (FH) are rarely seen in children, so there is no consensus on the age and sex distribution or the optimum method of repair. Recently, repair of the femoral hernias with mesh-plug has gained wide popularity in adults. The authors used this method in 4 children with FH and discuss its utilization in children.

Methods: Four consecutive children with femoral hernia were treated using mesh-plug. Patients' characteristics and operative technique was described.

Results: Plugging femoral defect with a mesh-plug was applied successfully in children. No complications were seen after a follow-up period for 2 years (range, 8 to 30 months).

Conclusion: Repair of femoral hernias with mesh-plug is performed easily and successfully in children.

INDEX WORDS: Femoral hernia, mesh-plug.

FEMORAL HERNIAS (FH) are rare in children. They account for less than 1% of all groin hernias.[1-5] There is no consensus on the age and sex distribution or the optimum method of repair for FH, because these hernias are so uncommon.[4,5] A large number of operative approaches have been described and used. Lichtenstein and Shore[6] started using the plug to treat FHs and recurrent inguinal hernias in 1968 and published their results in 1974. Since then, mesh plug utilization has been preferred by a large number of surgeons for repair of the FHs in adults.[7-9] We used this method in 4 children with FH and aimed to discuss its use in children because we were not able to find related literature in the pediatric age group.

MATERIALS AND METHODS

Four consecutive children with FH had been treated between 1998 and 2001. Information about age, gender, presentation, previous hernia repair, diagnosis, surgical findings, and results is presented in Table 1.

The patients were operated on under general anesthesia with subinguinal approach. Through an incision over the bulge, the femoral hernial sac was dissected free from surrounding tissues (Fig 1). The sac content was reduced, the neck of the sac was transfixed and ligated, and sac remnant was resected.

The boundaries of the femoral canal (the inguinal, lacunar, and pectineal ligaments) were exposed and the defect defined (Fig 2).

A strip of prolene mesh (Ethicon) was coiled into a firm plug in proper size to fill the femoral defect (Fig 3). Two encircling nonabsorbable sutures were used to prevent unravelling of the coiled plug. After mobilization and reduction of the femoral sac and its content, the prolene mesh-plug was inserted directly into the femoral canal. The plug was fixed with 2 prolene sutures placed between plug and inguinal and pectineal ligaments (Fig 4).

Routine hemostasis was followed by subcuticular skin closure. Except one patient admitted to our clinic with swelling, hyperemia and pain localized to inguinal region; prophylactic antibiotic was not administered.

RESULTS

We have used mesh-plug to repair FH since 1998. There were 4 patients (a girl and 3 boys) with FH compared with just over 600 children with inguinal hernias treated in the same institution in an identical period indicating an incidence of 0.5% of all groin hernias.

All 4 were unilateral; one was left and 3 were right sided. Ages of the 4 patients ranged from 5 to 14 years (mean, 9 years). In one of the cases, small intestine, and in the other, omentum, was found in hernia sac. In 3 patients the hernia sac was surrounded by excessive amount of properitoneal fat (Table 1).

In all patients, diagnosis of the FH could be established preoperatively. Mean operating time was 20 minutes. There were no complications or recurrences after 2 years of follow-up (8 to 30 months).

DISCUSSION

The etiology of femoral hernia is controversial. It generally is considered to be acquired as a result of increased intraabdominal pressure. McVay and Savage[10] hypothesized that a congenitally narrow posterior inguinal wall attachment onto Cooper's ligament with a resultant enlarged femoral ring is the important factor predisposing to the formation of a FH in response to increased abdominal pressure. Fresno et al[5] reported on children who became symptomatic in the neonatal period that led to the consideration that there must be some contributing congenital anatomic factors.

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Table 1. Summary of Patient Data

	Case 1	Case 2	Case 3	Case 4
Age, yr (Mean 9)	14	12	5	5
Gender	Female	Male	Male	Male
Presentation	Swelling	Swelling, pain, enduration	Swelling	Swelling
Diagnosis	Left femoral hernia	Right femoral hernia	Right femoral hernia	Right femoral hernia
Surgical findings	Empty sac	Herniated intestine	Herniated omentum	Empty sac
Complication	No	No	No	No
Previous hernia repair	No	No	Bilateral inguinal hernia	No
Postoperative observation (Mean, 20 mo)	30 mo	8 mo	10 mo	30 mo

In childhood, FH is found more frequently in boys than girls, and right-sided hernias predominate.[1-4] Three of our patients were boys.

Previous inguinal operation is also accused as a predisposing factor for femoral hernia.[4] One of our patients had bilateral inguinal herniorraphy done in our clinic by the same surgical team. In both sides we were able to find and high ligate indirect hernial sacs. There was no problem in postoperative follow-up in the first year. He presented with a bulge appearing in the inguinal region after the first postoperative year, thus, we do not consider this case a misdiagnosed FH patient but rather that it was acquired.

Reported accuracy of preoperative correct diagnosis is less than 50%[4,5] in childhood FH; however, we were able to establish the diagnosis in all 4 patients preoperatively with careful examination by an experienced pediatric surgeon. Preoperative diagnosis is possible if the bulge appears in a location inferior and lateral to that of the commonly occurring indirect hernia.[1,2,4] The current incidence of 0.5% of all groin hernias is consistent with the published figures of 0.1% to 0.9%.[1-5]

The ideal surgical approach to femoral herniorrhaphy remains controversial. There are various surgical procedures defined for treating FHs; consisting of high and low inguinal/femoral approaches (McVay, Bassini, Nyhus, simple repair of the femoral ring).[4,8,11] Prosthetic mesh in the form of a plug has been used extensively in adults to repair the FHs. It has rapidly gained popularity over the past 3 decades because of its simplicity, safety, and remarkable rate of success.[7,9,11] Brooks[11] compared mesh-plug hernia repair with laparoscopic repair in 100 adult patients and found that laparoscopic operation took longer than the open operation, postoperative discomfort and analgesic requirement were similar, and recurrence rate and cost were higher.[11]

We found that filling up the femoral canal with a prolene mesh-plug has some advantages in children, such as those reported in adults by others.[6-9,12] A strong repair can be achieved without tension, and the potential for recurrence is reduced significantly as could be seen by the recurrence-free follow-up periods of average 2 years. The recurrences were reported to be encountered most frequently within the first year of the postoperative period.[13]

There is no incision into the muscles or fascias of the abdominal wall and no requirement for difficult hernia repair techniques. Thus, this procedure can be performed more easily and rapidly than the inguinal or preperitoneal approaches. Because the structures of the inguinal canal are not incised or sutured, postoperative discomfort is reduced significantly.

These observations allow us to recommend this technique for FH repair in children.

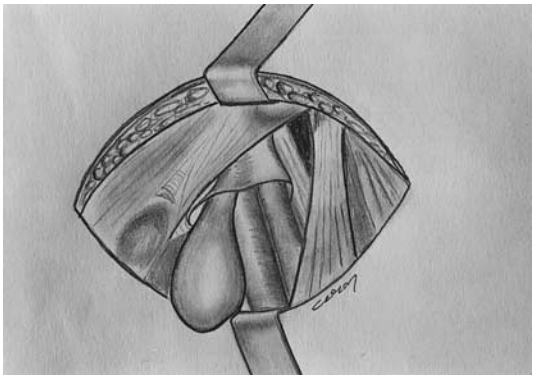

Fig 1. This figure shows the sac of a left femoral hernia.

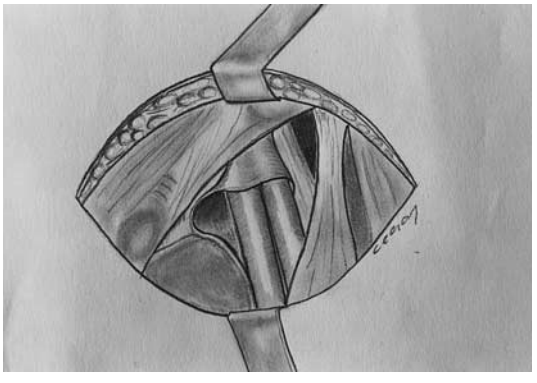

Fig 2. Appearance of the femoral defect after the dissection of the sac.

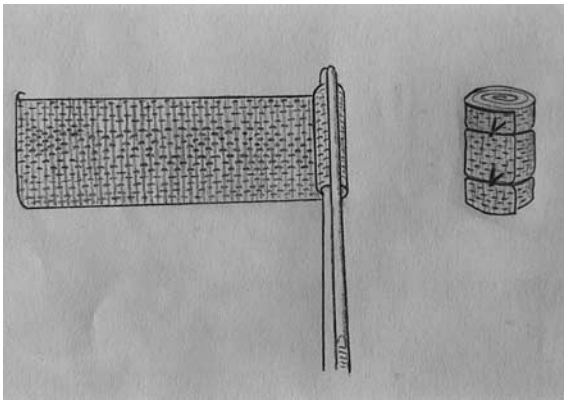

Fig 3. Preparation of prolene mesh plug.

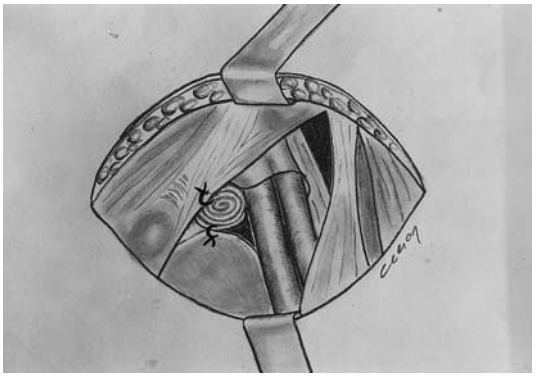

Fig 4. Placement and fixation of mesh plug into the left femoral defect.

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