

Synchronous femoral hernias diagnosed during endoscopic inguinal hernia repair

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Abstract

Background During totally extraperitoneal (TEP) endoscopic repair of inguinal hernias, it is possible to see the internal opening of the femoral canal. The aim of our study was to determine the incidence of synchronous femoral hernias found in patients undergoing TEP endoscopic inguinal hernia repair.

Method This was a retrospective review of prospectively collected data on 362 consecutive patients who underwent 484 TEP endoscopic inguinal hernia repairs during a 5-year period, May 2005 to May 2010. During surgery, both inguinal and femoral canal orifices were routinely inspected. The presence of unilateral or bilateral inguinal and femoral hernias was recorded and repaired accordingly.

Results There were a total of 362 patients. More males (343, 95%) underwent a TEP hernia repair than females (19, 5%). There were more cases of unilateral (240/362, 66%) than bilateral (122/362, 34%) inguinal hernias. A total of 18 cases of synchronous femoral hernias were found during operation. There was a higher incidence of femoral hernia in females (7/19, 37%) compared to males (11/343, 3%) ($P < 0.001$). None of the femoral hernias were clinically detectable preoperatively.

Conclusion Females undergoing elective inguinal hernia repair are more likely to have a synchronous femoral hernia than males. We suggest that all women presenting with an inguinal hernia also have a formal assessment of the femoral

canal. TEP endoscopic inguinal hernia repair is an ideal approach as both inguinal and femoral orifices can be assessed and hernias repaired simultaneously during surgery.

Keywords Femoral · Hernia · Inguinal · Totally extraperitoneal

The totally extraperitoneal (TEP) endoscopic approach for repair of inguinal hernia is an opportunity to visualise the internal opening of the femoral canal in addition to the inguinal orifices. By routinely inspecting these spaces, synchronous femoral hernias can be identified and repaired. Although data exist about the incidence of synchronous occult contralateral inguinal hernias, no studies have been published on the presence of asymptomatic femoral hernias diagnosed during TEP endoscopic inguinal hernia repair. We have routinely inspected the internal opening of the femoral canal in 362 sequential TEP endoscopic inguinal hernia repairs and present our data here.

Method

Data were collected prospectively from 362 consecutive patients undergoing TEP endoscopic inguinal hernia repair during the 5-year period from May 2005 to May 2010. A single surgeon, in the elective setting with full patient consent, performed all surgeries. Surgery was performed under general anaesthesia with a TEP endoscopic approach. The inguinal canal and internal orifice of the femoral canal on the symptomatic side were routinely inspected during the procedure. If hernias were identified, they were reduced and a three-dimensional anatomically shaped polypropylene mesh (3DMax[®], Bard, Warwick, RI, USA) was placed over the

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hernial orifices. The mesh was secured with fibrin sealant (Tisseel™, Baxter, Deerfield, IL, USA). Femoral hernias were defined as the persistent protrusion of peritoneum into the femoral canal when visualised during the TEP endoscopic approach. The presence of unilateral or bilateral inguinal and femoral hernias was recorded. Statistical analysis was performed using a χ^2 test.

Results

A total of 362 patients underwent 484 consecutive TEP endoscopic inguinal hernia repairs. There were more males (343 cases, 95%) than females (19 cases, 5%). Females were older (mean age = 52.4 years) than males (mean age = 45.9 years) in this study. There were more cases of unilateral (240/362, 66%) than bilateral (122/362, 34%) inguinal hernias (Table 1).

A total of 18 cases (5%) of synchronous femoral hernias were found during surgery. All femoral hernias were found to be synchronous with inguinal hernias and not misdiagnoses. Males and females in this subgroup were comparable in age (mean age = 51.9 vs. 49.5 years). There were more cases of unilateral (16/18, 89%) than bilateral (2/18, 11%) synchronous femoral hernias. Overall, there was a higher incidence of femoral hernia in females (7/19, 37%) compared to males (11/343, 3%) and this was statistically significant ($\chi^2 = 43.1$ with 1 df, $P < 0.01$).

None of the femoral hernias were clinically detectable preoperatively. Two patients, both females, had femoral hernias diagnosed by ultrasound preoperatively (Table 2). An additional eight patients with femoral hernias at surgery had a negative preoperative ultrasound for femoral hernia.

Discussion

Inguinal hernia repair remains one of the most common general surgical operations performed in the developed world. There have been numerous publications and several

systematic reviews confirming similar outcomes with open versus endoscopic hernia repair. A Cochrane review from 2002 found that patients who underwent endoscopic repair had less persistent postoperative pain and numbness and a quicker recovery overall compared to open repair patients, although there was a longer operative time and a higher rate of more serious complications [1]. A more recent review [2] found similar results and a decreased incidence of wound infection and haematoma following endoscopic repair. A cost-effectiveness analysis in that review found that TEP repair was more cost effective than open repair for bilateral hernias but not so for unilateral. This difference was reversed when possible repair of occult contralateral hernias was taken into account [2].

A case series published in 2000 of 552 patients with clinically unilateral inguinal hernias found that 62 patients (11.2%) had occult contralateral inguinal hernias at surgery [3]. Another study of 100 consecutive patients found a 22% incidence of occult contralateral inguinal hernias [4]. There are no reported studies in the literature regarding the incidence of occult femoral hernias found during endoscopic inguinal hernia repair.

Our study is an analysis of a single surgeon's experience of 484 consecutive TEP endoscopic inguinal hernia repairs on 362 patients. During the procedures the internal opening of the femoral canal was routinely inspected and femoral hernias reduced. Care was taken to place the hernia repair mesh over both inguinal and femoral canal defects. The mesh was routinely secured with fibrin glue. The use of fibrin glue to secure the mesh during hernia repair has been shown to be a safe alternative to staples, with some studies showing a lower pain score and higher quality-of-life scores postoperatively and a shorter mean recovery time for normal physical activity when compared to staples (7.9 vs. 9.1 days, respectively; $P < 0.001$) [5, 6].

A total of 18 cases (5%) of synchronous femoral hernias were found in our study. In only two cases was the diagnosis of synchronous femoral hernia made preoperatively by ultrasonography. None of the femoral hernias was detected clinically preoperatively. The sex distribution of

Table 1 Inguinal hernias in TEP repair

| | Total (<i>n</i> = 362) | Male (<i>n</i> = 343) | Female (<i>n</i> = 19) | <i>P</i> value |
|-----------------------------------|-------------------------|------------------------|-------------------------|----------------|
| Age (years) | | | | |
| Median | 46 | 46 | 49 | |
| Mean | 45.6 | 45.9 | 52.4 | |
| Inguinal hernia (direct/indirect) | | | | |
| Left | 108 | 99 | 9 | |
| Right | 132 | 126 | 6 | |
| Bilateral | 122 | 118 | 4 | |
| Femoral hernia | 18 (5%) | 11 (3%) | 7 (37%) | <0.001 |

Table 2 Synchronous femoral hernias in TEP endoscopic inguinal hernia repair

| | Total (<i>n</i> = 18) | Male (<i>n</i> = 11) | Female (<i>n</i> = 7) |
|-----------------------|------------------------|-----------------------|------------------------|
| Age (years) | | | |
| Median | 48.5 | 48 | 49 |
| Mean | 50 | 49.5 | 51.9 |
| Femoral hernias | | | |
| Left | 6 | 3 | 3 |
| Right | 10 | 8 | 2 |
| Bilateral | 2 | – | 2 |
| Preoperative | | | |
| Clinically detectable | None | None | None |
| Ultrasound preop. | 10 | 3 | 7 |
| Ultrasound diagnostic | 2 | 0 | 2 |

the cases is noteworthy. Only 19 of the 362 patients included in the study were female, reflecting the increased incidence of inguinal hernia in men. In this small cohort of women there was a 37% incidence of femoral hernia. Although the number of female patients here is small, the large number of male patients and low femoral hernia rate in this group strengthens the validity of this result.

It is well documented that the incidence of femoral hernias is higher in the female population compared to the male, but there are no previous studies on the incidence of synchronous and occult femoral hernias in the presence of an inguinal hernia. In this study, the incidence of synchronous femoral hernias in the presence of an inguinal hernia was found to be statistically more prevalent in females than males.

Results published from the National Danish Hernia Database show that patients having primary femoral hernia repair were more likely to have had previous inguinal hernia repairs [7]. In addition, the incidence of a femoral hernia in women after previous inguinal herniorrhaphy was 15 times higher than the rate of femoral hernia repair in the general female population. Due to the short median interval between hernia repairs, the authors suggested that the femoral hernias may have been overlooked during the primary operation rather than a result of disruptive surgery in this region [7]. Results published using the same database also reported that over a 5.5-year period, 4.3% of females having an inguinal hernia repair required reoperation for recurrent hernia. Of these, 41.5% of the reoperations revealed a femoral hernia compared to 5.4% in males. These data suggest the need for exploration of the femoral canal at the primary operation for inguinal hernia repair in women [8]. Our data support these recent findings.

In conclusion, females undergoing elective inguinal hernia repair are more likely than males to have a synchronous femoral hernia. In our series, women presenting with inguinal hernias and no clinical femoral hernia had a 37% chance of also having a femoral hernia found at TEP

endoscopic hernia repair. We suggest that all women presenting with an inguinal hernia have a formal assessment of the femoral canal either preoperatively or during surgery. TEP endoscopic inguinal hernia repair is an ideal approach as both inguinal and femoral orifices can be assessed easily and hernias can be repaired simultaneously during surgery.

Disclosures Drs. Putnis, Wong, and Berney have no conflicts of interest or financial ties to disclose.

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