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Laparoscopic totally extra peritoneal inguinal hernia repair – our method to treat inguinal hernia

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Inguinal hernia is the most common hernia, comprising 90% of all spontaneous hernias. Inguinal hernia repair is the most frequently performed operation in general surgery; more than 700,000 groin hernia repairs are performed in the United States annually [1,2].

Since Bassini's report of inguinal hernia repair in 1887 [3], numerous other techniques have been described. During the first half of this century, the repairs were based on bringing together and suturing the edges of the defect. These techniques resulted in high recurrence rates and postoperative morbidity due to the tension on the suture lines.

Two revolutions in inguinal hernia repair surgery occurred during the last two decades. The first was the introduction of tension free hernia repair by Lichtenstein in 1989 which reduced significantly the recurrence rates [4]. Open anterior tension free mesh repairs became the most common repairs over the world. The second, was the application of laparoscopic surgery for the treatment of inguinal hernia in the early 90's, which led to decrease in postoperative pain and faster recovery along with low recurrence rates.

In the beginning of the 90's, laparoscopic hernia repair was controversial since various studies reported

an early recurrence rate as high as 25% [2, 5]. However, after a decade of experience in laparoscopic hernia surgery, this method gained worldwide acceptance and became, in many centres, the first choice for inguinal hernia repair. In their prospective randomised controlled study, Bringman and co-workers, compared three tension-free methods of hernioplasty and concluded that laparoscopic hernioplasty is superior to tension-free open herniorrhaphy with mesh-plug and patch or Lichtenstien's operation in terms of postoperative pain and rehabilitation [6]. Laparoscopic hernia repair has several advantages over the conventional open methods as shown by prospective randomized trails comparing the two approaches. The major advantages include postoperative pain reduction, short recovery period, earlier return to work, better cosmetic results and cost effectiveness [7,8]. In addition, the laparoscopic approach allows viewing the entire myopectineal orifice and repairing any unexpected hernias and thereby, reduces the chance of recurrence [9,10].

Several laparoscopic techniques have been described to manage groin hernias [11-16]. Two laparoscopic techniques have become the most common procedures to repair these hernias; the transabdominal pre-peri-



toneal repair (TAPP) and the totally extra-peritoneal (TEP) repair. In both methods a mesh prosthesis is implanted into the pre-peritoneal space dorsal to the transversalis fascia. These techniques therefore present the minimally invasive version of the open mesh implantation techniques. In TAPP the surgeon goes into the peritoneal cavity and places a mesh through a peritoneal incision over possible hernia sites. TEP is superior because the peritoneal cavity is not entered and mesh is used to seal the hernia from outside the peritoneum (the thin membrane covering the organs in the abdomen). This approach is considered to be more difficult than TAPP but may have fewer complications.

The TAPP approach has been advocated for recurrent hernia, complicated hernias (sliding or incarcerated inguinal hernias) and hernias with previous pelvic surgery (prostatectomy). The later technique has been criticized for exposing intra-abdominal organs to potential complications, including small bowel injury and obstruction.

Laparoscopic TEP hernia repair gained ground in the past few years and is preferred over TAPP as it is less invasive and is associated with fewer complications. In a study of 1115 hernia repairs, comparing 733 TAPP with 382 TEP procedure, Felix et al. reported 11 major complications in the TAPP group (Two recurrence, 6 hernias in the trocar site and others) while, only one recurrence was observed in the TEP group and no intra-peritoneal complications [12]. In their comparative study, Khoury et al. found that patients underwent TEP received less narcotic analgesic than those underwent TAPP and were discharged more frequently at the operative day [17].

Since June 1990, our approach for inguinal hernia repair was laparoscopic TEP. Between June 1990 and Mai 2005, 2358 patients underwent laparoscopic hernia repair in our institute. A total of 3100 hernias were repaired. Of them, 2356 hernias were unilateral and the rest were bilateral. Indirect hernias were the most common, followed by direct and then femoral hernias. The majority of the hernias were repaired by TEP technique and only in 3% of them the repair was done by initial

or converted TAPP. Eleven percent of the hernias were recurrences after a conventional repair.

Mean operative time was 17 minutes in unilateral hernia and 24 minutes in bilateral hernia. There were 36 hernias (1.2%) that required conversion; 12 hernias were converted to open anterior Lichtenstein and 24 to laparoscopic TAPP technique. Most of these conversions occurred early in our experience for complicated hernias. The incidence of intraoperative complications rate was low. Inferior epigastric vessel injury occurred in 11 patients and was managed by clipping. One patient had partial thickness burn of the ileum during TEP converted to TAPP. This injury was recognized and treated immediately by intra-corporeal suturing. The patient recovered completely. One injury of spermatic cord occurred in a very complicated scrotal hernia. Forty-eight patients had subcutaneous emphysema early in our experience. Most of the patients were discharged at the second post-operative day.

The overall postoperative morbidity rate was 2.2%. Postoperative hematoma or seroma were the most common postoperative complications. All were managed by conservative treatment. Five patients suffered pain and burning sensation in the upper lateral thigh and in the inguinal area. Three of them required removal of tackers causing nerve entrapment at the lateral aspect close to the iliopubic tract. This occurred in our early experience at the time we used to fix the mesh by tackers or sutures. In this early experience period, the beginning, we used to insert the mesh through 12 mm trocar. This approach was ended with 3 cases of port site hernias, which needed operative repair. Six patients had urinary retention and needed catheterisation in the postoperative period. One patient suffered an intractable mesh infection, which was resolved by removal of the mesh at the 9th postoperative day. The recurrence rate was 0.35%. The recurrence rate for the first 200 repairs was 2.5%, but it decreased to 0.47% for the subsequent 1254 hernia repairs.

Historically, cost analysis favoured open hernia repair over laparoscopy (TEP or TAPP) [18,19]. But now, with a decade of experience in lap hernia, the cost of TEP repair is comparable with open repair [20,21],



this is mainly due to successful cost reduction strategies (factors related to learning curve effects including reduced operative time, surgical errors, unnecessary instrumentations, and materials. In addition to global variables including complications, postoperative pain, recurrences, and return to work).

According to our experience, laparoscopic hernia repair seems to be the favoured approach for most of the types of inguinal hernias in the hands of experienced laparoscopic surgeons. TEP is more advantageous than TAPP as the peritoneum is not violated and the intra-abdominal complications are fewer.

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