

Laparoscopic extraperitoneal inguinal hernia repair in the day-care setting

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Abstract

Background: Totally extraperitoneal (TEP) laparoscopic inguinal hernia repair is gaining popularity, and our preference is to perform this procedure as a day case. This study evaluates the suitability of TEP repair in the day-care setting.

Methods: A policy of day-care TEP repair, unless contraindicated, was adopted for inguinal hernia repair, and the outcome was prospectively evaluated. Of 87 consecutive inguinal hernia repairs, day-care TEP was possible in 54 (62%); 17 (20%) were in-patient TEP, 14 (16%) were open repairs, and 2 (2%) were converted from TEP to open repairs.

Results: Among day-care TEP repairs, median visual analog pain score at discharge was 2.3/10, and 43% of patients had no pain. Complications included cord hematoma 2 (4%) and seroma 3 (6%). Median times for stopping analgesia, resumption of full activity, and return to work were 3, 3, and 6 days respectively. Complete satisfaction with day-care TEP was expressed by 91% of patients; 9% were moderately satisfied, and none expressed dissatisfaction.

Conclusions: Day-care TEP repair is feasible in the majority of patients with inguinal hernias, and it is associated with minimal complications, excellent recovery, and a high degree of patient satisfaction.

Key words: Extraperitoneal inguinal hernia — Day-care TEP repair

“Three weeks is not too long a time for the patient to remain in bed. . . I consider that four weeks if possible would be even better than three.” (William Halsted, 1895, regarding inguinal hernia repair) [7].

A significant change in our approach to inguinal hernia repair has taken place over the past 100 years, and modern thinking emphasizes not only recurrence, but also other outcome measures including postoperative discomfort and rate of recovery. In recent years, the Lichtenstein tension-free

mesh repair has gained huge popularity because of its technical simplicity, reproducibility, rapid recovery, and excellent recurrence rates [1–15]. In further pursuit of the ideal, surgeons have sought to combine the advantages of tension-free mesh repair with those of minimally invasive surgery. Although we await the long-term results of randomized trials comparing laparoscopic and open repairs, the available data is promising. Consistent data now attests to the benefits of laparoscopic approaches compared with open repair in terms of postoperative discomfort, recovery, and patient satisfaction [2, 8, 12, 16, 18]. Growing evidence also suggests that in experienced hands, an endoscopic totally extraperitoneal technique results in minimal complications and early recurrence rates comparable with the best open repairs [5, 13, 17].

Laparoscopic inguinal hernia repair has evolved greatly since it was first described, and two techniques, each of which places a prosthetic mesh in the preperitoneal space, are currently popular. The transabdominal preperitoneal (TAPP) repair is the most widely described, but has the disadvantage of traversing the peritoneal cavity with the attendant risks [13]. The totally extraperitoneal (TEP) procedure traverses the preperitoneal space without entering the peritoneal cavity, averting the risk of intraperitoneal complications. The TEP procedure appears to be supplanting TAPP as the laparoscopic method of choice and appears to be associated with a lesser complication risk and a lower incidence of recurrence [5, 6, 13].

Among the issues that must be addressed if this technique is to become widely adopted is its suitability for day-care surgery. The requirement for general anesthesia may weigh against laparoscopic TEP repair in this respect. Rudkin et al. [14] have suggested that in the day-care setting, open repair under local anesthesia results in a better perioperative course than does laparoscopic repair under general anesthesia. A recent study from Denmark attests to the low postoperative morbidity, high satisfaction rate, and significant cost reductions associated with day-care open repair under general anesthesia [3]. Evans et al. [4] however, have shown very satisfactory results with day-care TAPP repair.

In this prospective study we evaluate the feasibility, outcome, and patient satisfaction with day-care TEP repair.

Methods

This study prospectively evaluates a policy of day-care laparoscopic TEP repair among 87 consecutive adult patients who underwent inguinal hernia surgery between January and June 1996.

Selection for day-care TEP repair

The TEP procedure performed under general anesthesia was routinely used for inguinal hernia repair unless contraindicated. Absolute contraindications included irreducible hernias, patient preference for open repair, and contraindications to general anesthesia. Relative contraindications included large inguinoscrotal hernias and lower abdominal surgical scars. Patients selected for TEP repair were treated as day cases unless this was unsuitable because of severe or uncontrolled systemic disease, social problems, obesity, or a history of anesthetic problems. Day-care patients consented and were counseled as outpatients by both surgical and day unit staff. They were given information leaflets detailing the nature of surgery, admission and discharge procedures, postoperative analgesia, recovery expectations, possible postoperative problems, and contact details for surgical staff after hospital discharge.

Anesthetic technique

Rectal diclofenac sodium (100 mg) was administered preoperatively. Anesthesia was induced with propofol 2.5 mg/kg, and fentanyl 1.5 μ /kg was administered for analgesia. Atracurium 0.6 mg/kg was used for muscle relaxation. Patients were intubated and ventilated with intermittent positive pressure ventilation. Anesthesia was maintained with N₂O and isoflurane, and supplemental analgesia was provided with fentanyl 0.5–1 μ /kg. On completion of surgery, neuromuscular blockade was reversed with glycopyrrolate 0.5 mg and neostigmine 2.5 mg. Postoperative analgesia included morphine 2 mg administered intravenously as required in the recovery room. Droperidol 0.625–1.25 μ g was used as an antiemetic. On discharge, mefenamic acid 250–500 mg was dispensed to be used every 8 hours as required, with a sufficient supply for 7 days.

Surgical technique

The extraperitoneal space was developed by using a balloon inserted through a 12-mm port at the umbilicus and maintained with CO₂ at a pressure of 10 mmHg. The space was developed medially beyond the symphysis pubis and laterally to the anterior superior iliac spine. In addition, one 10-mm and one 5-mm port were placed in the midline below the umbilicus. Direct hernias were reduced, and indirect sacs were dissected from the spermatic cord and either fully reduced or ligated and transected. A 15 × 12-cm knitted polypropylene mesh was placed in the preperitoneal space behind the posterior wall of the inguinal canal, and the space was collapsed, securing the mesh without the use of staples. The fascia and skin at the port sites were closed in a standard manner.

Postoperative assessment of day cases

Patients were assessed postoperatively at the time of discharge from hospital, at 24 h, at 1 week, and at 1 month. Factors assessed included visual analog pain scores, analgesia requirements, postoperative symptoms, physical signs, and complications. For measurement of visual analog pain score, patients were asked to mark a point along a 10-cm line with "no pain" at one end and "most severe pain imaginable" at the other. Patients also were asked to grade their degree of satisfaction with the procedure by choosing one of three categories: fully satisfied, moderately satisfied, or dissatisfied. Recovery parameters recorded included the days when the

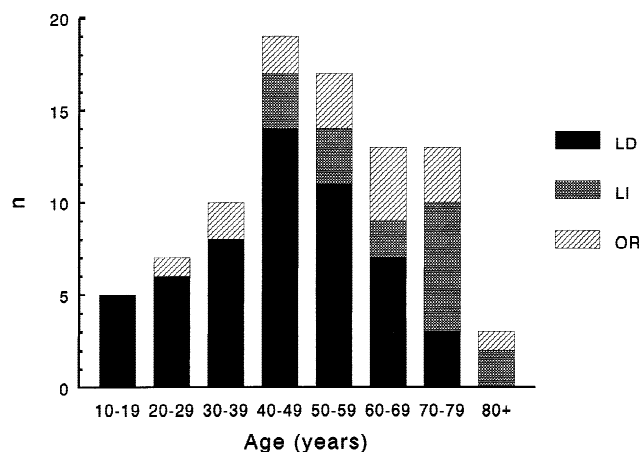


Fig. 1. Correlation between age and whether treated as laparoscopic day case (LD), laparoscopic inpatient (LI), or open repair (OR).

pain was gone, analgesics were stopped, normal activity was resumed and patients returned to work.

Results

Procedures performed

In all, 71 patients (82%) were suitable for TEP repair; 14 (16%) had open surgery; and 2 (2%) were converted from TEP to open repair. The reasons for unsuitability for TEP repair included previous lower abdominal incisions (4 patients), contraindications to general anesthesia (3 patients), previous laparoscopic repair (2 patients), obesity (2 patients), patient preference (2 patients), and hernia size (1 patient). Of the 71 patients undergoing TEP repair, 54 (76%) were suitable for day-care surgery, and 17 (24%) underwent inpatient procedures. The dominant reasons for admission were concomitant medical illness (10 patients), excessive distance from the hospital (3 patients), and social circumstances (2 patients). Of the TEP repairs, 77% were indirect hernias, 11% were direct, 10% recurrent, and 1% pantaloon. Bilateral repairs were performed in 3% of cases. We do not explore the contralateral side in the absence of a clinical hernia. Both inpatient and open procedures were increasingly indicated with advancing age (Fig. 1). Day-care TEP repair was possible in 76% of those younger than 60 years as opposed to 34% of those older than 60 years (Fig. 2).

Complications of TEP repairs

Two patients (3%) required conversion to open repair, one because of bleeding and the other because of lacking visibility. Each was attributable to the development of a pneumoperitoneum and ultimately to operator inexperience. Other complications included cord hematoma 4 (5%) and seroma 3 (4%). None of these patients was significantly symptomatic except for one patient who had a cord hematoma that caused some pain for a period of 6 weeks postoperatively, but ultimately resolved spontaneously. At this

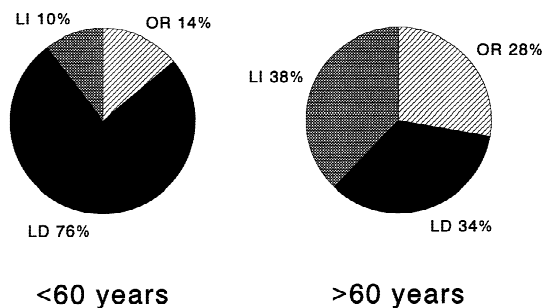


Fig. 2. Relationship between procedure performed and patient age: older or younger than 60 years. LD, laparoscopic day case; LI, laparoscopic inpatient; OR, open repair.

writing, no recurrences have been detected with a median follow-up of 12 months (range, 9–15 months).

Outcome of day-care TEP repair

Among the 54 day-care TEP repair patients, mean visual analog pain score on discharge was 2.3/10, and 43% were completely pain free. Median postoperative times for analgesia cessation, complete disappearance of pain, return to full activity, and return to work were 3 (range, 0–21), 3 (range, 0–21), 3 (range, 1–21), and 6 (range, 1–31) days, respectively. A total of 91% expressed complete satisfaction with day-care TEP repair; 9% were moderately satisfied, and no patient was dissatisfied. Of five patients who expressed moderate satisfaction, three were uncomfortable postoperatively and would have preferred overnight admission: One would have liked more preoperative information, and the other was the patient with the painful cord hematoma.

Discussion

This study demonstrates the suitability of the TEP procedure for day-care inguinal hernia repair in the majority of patients. More than 60% of a consecutive series of adult patients of all ages undergoing inguinal hernia repair were suitable for day-care TEP. This figure increased to 76% in those younger than 60 years, and increasing experience and confidence with the technique should lead to further increases in these figures. Complications were few, confined primarily to patients with minor hematomas and seromas, and no patient required readmission to the hospital after discharge.

This low complication rate with TEP repair is consistent with the growing literature on the technique [5, 13, 17], and is critical to the success of the operation, especially as a day-care procedure. Although two patients were converted to open repair and admitted from the day ward, in both cases operator inexperience and the development of a pneumoperitoneum were factors. Therefore, we would expect the conversion rate to be very low in long-term use of the technique. Pain at the time of discharge was minimal, allowing patients to return home in relative comfort. Patients expressed a high degree of satisfaction with their treatment, and no patient expressed dissatisfaction. As with all day-

care surgery, adequate preoperative information and counseling are essential to the success of day-care TEP. All patients had detailed discussion regarding the procedure with the surgical and day-ward staff, and information leaflets detailing the essentials of the procedure were provided.

Although definition of the role for TEP repair awaits long-term results of randomized trials, it is clear from our study that excellent short-term results can be achieved, and that this procedure warrants serious consideration. Our excellent results in terms of postoperative comfort, recovery, and length of absence from work agree with those reported by virtually every series [10, 12, 16, 18], and are considerably better than we would expect from open repairs. Randomized trials have consistently demonstrated substantially more rapid recovery after laparoscopic repair than open techniques [12, 16, 18]. We have demonstrated in a randomized trial that recovery may be further enhanced by intraoperative infusion of 40 ml of a 0.25% bupivacaine hydrochloride solution with adrenaline through a laparoscopic port into the extraperitoneal space in patients undergoing day-care TEP [11]. The extraperitoneal space lends itself ideally to this form of analgesia, allowing bupivacaine to come into direct contact with the dissected tissues on collapse of the space at the end of the procedure.

Increasing data also suggest that complication rates are lower for TEP repair than for open techniques [13, 17], the morbidity difference relating primarily to wound problems. Laparoscopic surgery virtually abolishes chronic wound pain [10, 12], a common and most difficult problem following open repair. Mesh stapling with its potential for nerve entrapment and chronic pain is perhaps unnecessary with the TEP technique provided a large mesh is used. If staples are used in selected patients, careful placement is critical. A disadvantage of the TEP repair is its relative technical difficulty leading to a long learning curve [9] and a large variation in outcome between individual surgeons [6], although whether this differs from that of open repair is debatable. Perhaps the ultimate answer to the question of open mesh repair versus endoscopic repair is surgical judgment in tailoring the repair to the individual patient, laparoscopic repairs being especially suitable for bilateral and recurrent hernias and in patients anxious for rapid recovery.

In experienced hands day-care TEP repair is feasible in the majority of patients with inguinal hernias and associated with minimal complications, excellent recovery, and a high degree of patient satisfaction.

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