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A prospective comparison of ambulatory endoscopic totally extraperitoneal inguinal hernioplasty versus open mesh hernioplasty

Hung Lau*, Nivritti G. Patil

Day Surgery Center, Department of Surgery, University of Hong Kong Medical Center, Tung Wah Hospital, 12 Po Yan Street, Pokfulam, Sheung Wan, Hong Kong

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Abstract

Endoscopic extraperitoneal inguinal hernioplasty (TEP) has become an established technique for the repair of inguinal hernia but its application as a day case procedure remains contentious. The objective of the present study is to compare the outcomes of ambulatory TEP and open mesh hernioplasty. From 1 February 2001 to 15 January 2002, a total of 31 patients underwent ambulatory endoscopic extraperitoneal inguinal hernioplasties at our institution. The outcomes of these patients were compared with those of a cohort of 31 patients who underwent ambulatory open mesh hernioplasty during the same period. The operation time, time taken to ambulate and micturate after surgery, postoperative morbidity and unplanned admission rates were similar between the two groups. Pain scores upon coughing on postoperative days 0, 1, 4, 5 and 6 were significantly lower in patients who underwent ambulatory TEP than those who had open mesh repairs. In conclusion, ambulatory endoscopic TEP conferred a significant reduction of postoperative pain scores compared with open repair. TEP is a safe and efficacious technique for the repair of inguinal hernia in an ambulatory setting. It should be a therapeutic option for day case repair of inguinal hernia.

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1. Introduction

Management of inguinal hernia has undergone a great evolution in the past two decades. Ambulatory surgery and endoscopic hernioplasty have been gaining in popularity in recent years [1–3]. Open mesh hernioplasty is the contemporary choice of technique for day case hernia repair in our institution. For patients who require hospitalization, endoscopic totally extraperitoneal inguinal hernioplasty (TEP) has been an alternative option for inguinal hernia repair at our institution since 1999. O’Riordain et al. [4] demonstrated the feasibility of day case TEP in the majority of patients with inguinal hernias. However, the safety and suitability of endoscopic inguinal hernioplasty in the day care setting remains contentious [5,6]. The objectives of the present

study were to evaluate and compare the outcomes of ambulatory TEP and open mesh hernioplasty.

2. Patients and methods

From 1 February 2001 to 15 January 2002, a total of 31 patients underwent ambulatory TEP. The outcomes of these patients were compared with those of a cohort of 31 patients who underwent ambulatory open mesh hernioplasty during the same period.

2.1. Pre-anaesthetic assessment

All patients with inguinal hernias were assessed by a specialist surgeon at the pre-anaesthetic assessment clinic of the Day Surgery Center. Patients were given the options of either TEP or open mesh hernioplasties. A history of lower midline abdominal surgery was considered to be a contra-indication for TEP.

* Corresponding author. Tel.: +852-2589-8328; fax: +852-2548-1548.

E-mail address: lauh@hkucc.hku.hk (H. Lau).

2.2. Day of operation

All patients were admitted to the Day Surgery Center on the day of operation after an overnight fast. Procedures were scheduled in the morning session of the operation list. All TEPs and open mesh hernioplasties were performed under general anaesthesia. The principles of both operative techniques have been described elsewhere [7,8]. Hernia types were determined intraoperatively according to the Nyhus classification [9].

2.3. Postoperative management

After separate assessments by the operating surgeon and the anaesthetist, the patients were discharged on the same day. All patients were prescribed an oral compound analgesic, propoxyphene 50 mg and paracetamol 325 mg, four times daily and diclofenac sodium SR 100 mg daily to be used as required. A 24-h telephone hotline was available to patients in case of any problems or queries.

All patients had follow-up at the Hernia Clinic 1 week after discharge. Telephone follow-up on the patient's condition was performed by a registered nurse on postoperative days 1 and 3. The total number of analgesic tablets taken by the patients on postoperative days 1 and 3 was documented.

2.4. Statistical analysis

Statistical difference between the two groups was determined by Student's *t* test and chi-square test where appropriate. A *P* value of less than 0.05 was regarded as significant. Statistical analysis was performed with the help of computer software (SPSS/PC+ 9.0, SPSS, Chicago, IL, USA). Values were expressed as mean \pm standard deviation (S.D.).

3. Results

3.1. Demographic features and operative details

The demographic features and hernia types of the two groups were comparable (Table 1). The mean operative time for ambulatory TEP and open repair was 63 ± 22 and 62 ± 18 min, respectively (*P* = ns). All TEPs were successfully performed without the need for conversion to other approaches.

3.2. Postoperative recovery

With regard to recovery variables, the times taken to ambulation were 2.5 ± 0.6 and 2.6 ± 0.7 h for the TEP and open repair groups, respectively (*P* = ns). The times

to micturition were 3.5 ± 1.1 and 3.2 ± 1.2 h, respectively, for the ambulatory TEP and open repair groups (*P* = ns). The time to discharge after ambulatory TEP was 5.5 ± 1.1 h, which was significantly shorter than that following ambulatory open hernioplasty, 6.0 ± 0.92 h (*P* < 0.05).

3.3. Pain scores and analgesic requirements

Postoperative pain scores at rest were significantly lower in patients after ambulatory TEPs than those who underwent open repairs on postoperative days 0, 1, 4, 5 and 6 (Fig. 1). Comparison of the daily pain scores upon coughing also showed significant differences between the two groups on postoperative days 5 and 6 (Fig. 2). Telephone survey found no significant difference in the number of analgesic tablets taken by the two groups of patients on postoperative days 1 and 3.

3.4. Postoperative morbidity

Two patients who had undergone open mesh hernioplasties were admitted overnight for acute retention of urine (*n* = 1) and medical observation (*n* = 1). Two patients who received ambulatory TEPs were also admitted because of bradycardia (*n* = 1) and paroxysmal atrial fibrillation (*n* = 1). The patient who developed bradycardia was subsequently diagnosed to have Wolff–Parkinson–White syndrome. No patient in the open repair group had to be subsequently readmitted, but one patient who had undergone TEP required hospitalization on postoperative day 2 for nausea and groin pain, both of which resolved spontaneously.

Postoperative morbidity in patients who underwent open mesh hernioplasties included superficial wound dehiscence (*n* = 2), wound infection (*n* = 1) and wound bruising (*n* = 1). Only one patient who had ambulatory TEP suffered from wound bruising. There was no difference in the postoperative morbidity rates between the two groups. All morbidities resolved spontaneously without the need for surgical intervention.

3.5. Convalescence

The mean time taken to resume outdoor activities was 3.9 ± 2.4 and 4.2 ± 3.2 days for patients after ambulatory TEPs and open repairs, respectively (*P* = ns). The mean length of convalescence before returning to the work place was 9.8 ± 6.0 and 12.9 ± 15.9 days for patient who underwent ambulatory TEPs and open repairs, respectively (*P* = ns).

Follow-up ranged from 1 week to 6 months with a mean follow-up of 2 months. No clinical recurrence was detected during follow-ups.

Table 1
Demographic features and hernia anatomy of the two groups of patients

	Ambulatory TEPs (n = 31)	Open hernioplasties (n = 31)	P
Age (years) (mean \pm S.D.)	56 \pm 10.0	55 \pm 11.7	ns ^b
Male:female	30:1	28:3	ns ^c
Hernia anatomy ^a			ns ^c
II	18	23	
IIIA	7	6	
IIIB	5	2	
IVB	1	0	

^a Nyhus classification [9].

^b Student's *t*-test.

^c Chi-square test; ns, no significance.

4. Discussion

The present study demonstrated that postoperative pain was significantly lower in patients who underwent ambulatory TEP than those who had open tension-free mesh hernioplasties. Meta-analyses of randomized trials also confirmed the significant difference in postoperative pain between laparoscopic and open repairs for inguinal hernia [10,11]. A recent multicenter randomized clinical trial demonstrated significant benefits in the short-term quality of life for patients who underwent laparoscopic repair, as reflected by the additional quality-adjusted life years gained [12]. Reduced postoperative pain was the chief advantage of TEP compared with the open approach.

A lower incidence of wound complications was observed in patients after TEPs. This finding was compatible with those noted in other reports [13,14]. The smaller incisions required for TEP contribute to the reduced risk of wound morbidity. Potentially serious complications were a concern in endoscopic hernio-

plasty but they were rarely encountered. As a high degree of skill and concentration is required during TEP, the application of this procedure in the day case setting should be adopted only by experienced surgeons.

A number of studies has reported a significantly earlier return to work and normal activities in patients who underwent laparoscopic repair compared with those after open sutured repair [15–18]. The present study also demonstrated similar findings but the difference was not statistically significant. Heikkinen et al. [19] conducted a prospective randomized study on the cost and outcome comparison between laparoscopic and Lichtenstein hernia operations. When the cost of lost working days was considered in the overall expense, the total costs for working patients were lower if the laparoscopic technique was used.

Expensive instruments have been a deterrent to the adoption of TEP [20,21]. However, with the utilization of reusable instruments and the adoption of non-stapling techniques, the cost of TEP can be substantially reduced. Another argument against TEP has been the

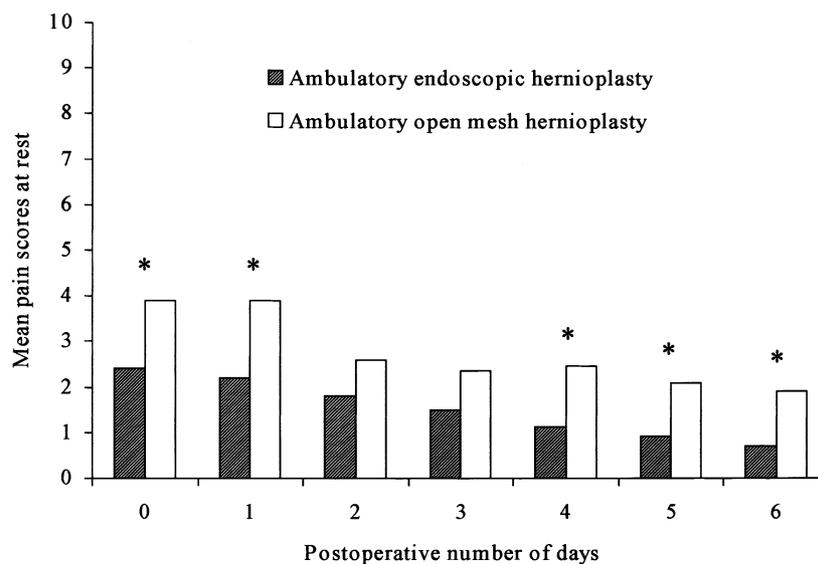


Fig. 1. Bar chart showing mean postoperative linear analogue pain scores at rest in groups I and II patients. *, Indicates $P < 0.05$ (Student's *t*-test).

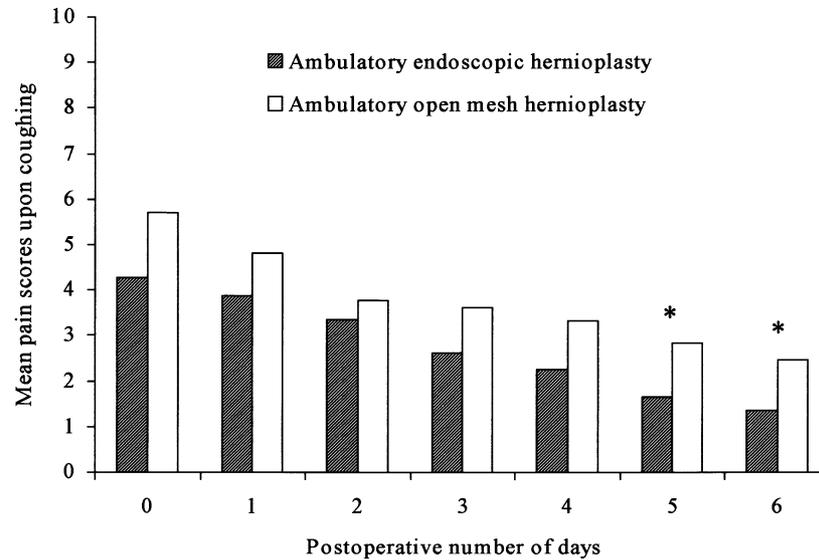


Fig. 2. Bar chart showing mean postoperative linear analogue pain scores upon coughing in groups I and II patients. *, Indicates $P < 0.05$ (Student's t -test).

requirement of general anesthesia for endoscopic repair. Rudkin et al. [5] and Subramaniam et al. [22] demonstrated that open inguinal hernia repair under local infiltration block was cost-effective for the hospital. However, acceptance of local anaesthesia and the operation preference of patients must be taken into account.

In conclusion, ambulatory TEP is superior to open mesh hernioplasty with respect to postoperative pain. A lower incidence of wound complications was also observed in patients who underwent ambulatory TEP compared with those who had open mesh hernioplasties. TEP is a safe practice for the repair of inguinal hernia in the day case setting. It should be a therapeutic option for patients who opt for day case inguinal hernia repair.

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