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Lichtenstein unilateral hernia repair: results of 961 cases in a day surgery unit

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Abstract

The objective was to evaluate the short and long term results of the open tension-free mesh repair as a day case. A retrospective study of 961 elective inguinal hernia patients over a 5 year period was undertaken. The setting was a Day Surgery Unit of a District General Hospital where surgeons of different levels of skill perform the operations, according to a standardised protocol, using local anaesthesia with sedation and mesh repair. A total of 93% of the patients were discharged and sent home the same day. Morbidity was 4.4%; no mesh required removal; the overall recurrence rate was 2.2% (0.7% for primary hernias and 5.2% for recurrent hernias). The satisfaction rate with the repair was high (> 95%). We conclude that the Lichtenstein repair is highly suitable for day case surgery. Standardization of the anaesthetic-hernia repair technique improves the results and the quality of care provided.

Keywords: Inguinal hernia; Open tension-free repair; Ambulatory surgery; Local anaesthesia

1. Introduction

Inguinal hernia repair is the commonest operation performed on males by general surgeons [1]. More than 60% of inguinal hernias in Spain are carried out by traditional open techniques under general anaesthesia [2] and the proportion of adult patients treated as day cases was 17% in 1993 [3]. In the last few years, multiple factors (socio-economic and techniques) have contributed to change the approach to hernia repair. The introduction of the tension-free mesh repair, developed by Lichtenstein, has been a determinant, enabling a shorter convalescence period, a lower complication rate and a lower recurrence rate [4].

Since the opening of the Day Surgery Unit (DSU) at our District General Hospital (DGH), the Lichtenstein operation has been used for the treatment of inguinal hernias on a day basis. The inpatient treatment carried out in the same hospital involved, on average, a 4.5 day hospitalisation period [5]. Inpatient hernia repair was undertaken using the Bassini technique and we changed to tension-free techniques with local anaesthesia for ambulatory patients. It is very important to test whether results with this DSU method are acceptable. We present our series of unilateral inguinal hernia repairs with short and long term follow up, operated upon by several surgeons in a DSU of a public DGH serving a rural and geographically diverse population.

2. Materials and methods

Over a 5 year period (April 1992 to April 1997) operations on a total of 1,149 patients with unilateral inguinal hernia were performed in the Day Surgery Unit (DSU) located at the El Tomillar Hospital belonging to the Valme University Hospital—a teaching District General Hospital. Of these patients, 961 (71.9%) were treated by Lichtenstein tension-free repair, and form the basis of our report.

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Inclusion criteria were: (a) patient acceptance; (b) anaesthetic risk (American Society of Anaesthesiologists) ASA I, II or III well controlled preoperatively; (c) social (housing conditions, accessible telephone, less than 1 h travel time, responsible accompanying person). Only patients with large irreducible inguino-scrotal hernias were excluded. The patients were given booklets with information on the procedure, operation date, postoperative care and contact telephone number.

The mean age was 51 years (range 16–84) with 79% of the patients being between 31 and 70 years. The mean weight was 73.7 kg (range 50–120), 895 (93%) were male and 66 (7%) women. Of the 961 hernias, 791 (82.3%) were primary and 170 (17.7%) recurrent, 497 (51.7%) were indirect, 376 (39.1%) direct and 88 (9.2%) combined (Table 1). The anaesthetic ASA risk was: in 419 (43.6%) ASA I, 459 (47.8%) ASA II and 83 (8.6%) ASA III well controlled.

All the patients attended the DSU on the morning of operation, and it was intended they be discharged 2–6 h after the procedure. In the operating room, all the patients were routinely monitored (heart rhythm, blood pressure and oxygen saturation) by a consultant anaesthetist or supervised resident.

Local anaesthesia (a 50:50 mixture of 1% mepivacaine and 0.5% bupivacaine) in combination with propofol sedation was the standard anaesthetic technique in 924 (96.1%) patients as has been described elsewhere [6,7]; spinal anaesthesia was used in 26 (2.7%) patients, general anaesthesia in 8 (0.8%), and local in 3 (0.3%) patients. In addition, the wound was irrigated with local anaesthesia (0.25% bupivacaine) prior to closure. Prophylactic antibiotic therapy was commonly used.

The operations were performed by surgeons of all degrees of skill (staff and adequately supervised residents). The tension-free patch with a mesh (Bard^{R} Marlex^{R}), as developed at the Lichtenstein Hernia Institute [4], was used in 935 (97.3%) patients and the 'plug' technique [8] in 26 (2.7%) patients with recurrent hernias. Indirect sacs (51.7%) were commonly inverted without ligation or excision. Direct sacs (39.1%) were inverted and the posterior fascia transversalis imbricated. In 88 (9.2%) cases there was a combined type of hernia. In short, the entire posterior wall of the inguinal canal is covered with an 8×16 cm size mesh which is sutured inferiorly to the inguinal ligament and the conjoint tendon superiorly. The mesh must overlap by 1–2 cm medially over the pubic tubercle. Only a single nonabsorbable monofilament suture is required to construct a new internal ring crossing the two tails of the split mesh around the emerging cord. [4]. Recurrent hernias were repaired in the same way as primary hernias except in cases of small defects when a 'plug' was used.

Table 1
Patients' details ($n = 961$)

Sex ratio (M:F)	895:66
Age (years)*	51 (16–84)
Primary hernias	791
Recurrent hernias	170
Type of hernia	
Indirect	497
Direct	376
Combined	88
Anaesthesia	
Local + sedation	924
Spinal	26
General	8
Local	3
Surgical technique	
Open tension-free patch	935
Plug	26

* Median values.

After the operation, patients stayed in the recovery room until their Aldrete scores [9] were > 9. They were then discharged to the stage 2 recovery area of the DSU. Periodic home-readiness evaluation was made with special attention to ability to walk, minimal pain or nausea, no wound bleeding, per Os fluids and voiding. Patients were always accompanied home by a responsible adult. They were provided with analgesic tablets and also instructed about postoperative problems.

Follow-up was undertaken the following day by telephone or a domiciliary visit by nurses of the DSU. The patients were given appointments for 4 weeks later and 1 year later for clinical examination. A standardised data form was used to collect information about complications, return to daily activities and recurrences. Satisfaction with care was measured by an anonymous questionnaire 2 months after surgery.

3. Results

The average operative time was 30 min. The average time in the recovery room was 26 min. A total of 893 patients (93%) left the hospital as day cases, 3 h (on average) after the conclusion of surgery (Table 2). A further 68 (7%) could not be discharged home the same day because of: inadequate preoperative selection, 15 (22%); changing patient's preference 17 (25%); long distance travel 10 (14.7%); surgical complications 11 (16.2%); anaesthetics reasons 11 (16.2%) and wound pain 4 (5.9%) (Table 3).

Table 2
Times of discharge No. (%)

Same Day (0–6 h)	893 (93%)
Short stay (1–3 days)	68 (7%)

Table 3
Unplanned admission ($n = 68$)

Inadequate selection	15
Patients' preferences	17
Long distance travel	10
Surgical complications	11
Anaesthesia reasons	11
Wound pain	4
Total	68 (7%)

There was no mortality. Overall morbidity was 4.4% (43 patients) divided into early morbidity 1.1% (occurring during the DSU stay) and late morbidity 3.3% (within 1 month after surgery) (Tables 4 and 5)

Postoperative pain: Of the patients, 86% required oral analgesia for only 3–4 days. Return to activity: 63% of our hernia patients were manual workers (mainly heavy agricultural tasks; 73% of them with salaried jobs and 27% self-employed); 5% desk workers; 24% retired; and 8% unemployed. 43% of manual workers ($n = 605$) returned to work within 30 days or less. 75% of desk workers ($n = 48$) were at work within 15 days. Satisfaction rate: 70% of questionnaires were returned 2 months after the operation, and more than 95% were highly satisfied with the results of the operation. Recurrences: The long-term follow-up was carried out by clinical examination of the inguinal region and genitalia. To date 644 patients have been checked. Thus a follow up of operated hernias of 67% was obtained with a minimum follow-up of 12 months and a maximum of 63 months. The average length of follow-up was 36.4 months, 14 recurrences were observed (2.2%). The incidence of known recurrence therefore is 2.2% if one considers only the 644 patients followed up (Table 6). Out of these 14, there were 5 recurrences (3 indirect, 1 direct and 1 combined) of primary hernias and 9 (6 following multiple repairs; 2 after one repair and 1 femoral hernia after previous inguinal repair) following operated recurrent hernias.

4. Discussion

Our results with the open tension-free mesh repair of Lichtenstein as a day case are acceptable. All surgeons in our DGH have quickly and voluntarily embraced this simple technique and accepted the three important common objectives: organisational (day surgery); anaesthetic (local anaesthesia) and surgical (Lichtenstein repair). This retrospective study has enabled us to know what is happening in a DGH with a DSU used by different general surgeons (staff and residents).

Before the DSU was opened (February 1992), most of the inguinal hernias in our DGH were performed using a great variety of techniques and on an inpatient basis The trend to avoid unnecessary hospitalisation in hernia surgery has been widely supported [10]. Day surgery can now be considered as the best option for more than 90% of elective hernia repairs. With surgeons it is very difficult for all to agree upon a specific technique. However, we have concentrated on the progressive standardisation of the care process to allow us to improve the results [11] (Table 7).

The type of operation for inguinal hernia repair must not be considered in isolation. Other relevant factors include the anaesthetic technique, the attitudes of the patient and the decision on the optimal care environment (inpatient or ambulatory).

Encouraged by some studies [6,12,13] we started to use local anaesthesia with sedation as a routine method for inguinal hernia repair. Only 2.7% of hernias seen by us were not suitable for surgery under local anaesthesia. In the DSU, it is a safe alternative to general anaesthesia, well tolerated by patients, reduces fear and anxiety and allows the treatment of large hernias as day cases [7]. According to some data [14] the local sedation approach was associated with a significant reduction in the time to achieve a sitting position in the recovery room and the time for home-readiness. These shorter times affect efficiency, allowing greater patient throughput in the DSU [15]. Important complications are virtually eliminated (urinary and chest) and additionally

Table 4
Early complications ($n = 961$)

Wound bleeding	5
Wound haematoma	3
Femoral nerve block	2
Scrotum haematoma	1
Total	11 (1.1%)

Table 5
Late complications ($n = 961$)

Wound haematoma	12 (1.3%)
Persistent wound pain	7 (0.7%)
Wound seroma	4 (0.4%)
Cord haematoma	4 (0.4%)
Hydrocele	3 (0.3%)
Testicular atrophy	1 (0.1%)
Wound abscess	1 (0.1%),
Total	32 (3.3%)

Table 6
Recurrence rate ($n = 644$)

Follow-up	Clinical examination
Follow-up rate	644 (67%)
Average length follow-up	36.4 months (12–63)
Overall recurrence rate	14 (2.2%)
Primary hernias	5 (0.7%)
Recurrent hernias	9 (5.2%)

Table 7
Quality indicators

Recurrence rate	2.2%
Postoperative morbidity	4.4%
Patients' satisfaction	>95%
Unplanned admissions	7%
Return to activities	<30 days

other benefits such as the testing of the repair and immediate mobilisation have been confirmed by our experience. Despite these advantages the technique has not gained widespread acceptance in Spain and is used in only 16.3% of hernia operations [2].

The introduction of the tensionless repair technique has had an important impact on surgeons' and patients' attitudes towards hernia surgery. Surgeons are more confident with this simple repair that can be applied to the majority of hernias. The use of meshes has also changed the perception of the surgery on the part of patients, having reduced the fear of postoperative pain, the change of recurrence and the length of convalescence. Our experience verifies high acceptance rates. More than 95% of patients were satisfied with the open mesh repair in the DSU.

Complications cause postoperative discomfort, increase the convalescent period [16] and can be a reason for unplanned admission. Especially in the case of ambulatory surgery, where problems occur after leaving the hospital, accurate recording and monitoring of complications within 1 month of surgery is very important. Our overall morbidity rate was 4.4%, which compares favourably with our previously reported rate of 5.9% [7]. Wound haematoma 15 (1.6%) was the most common postoperative problem, followed by persistent inguinal pain 7 (0.7%). Only one patient required drainage of a wound abscess. There was one case of testicular atrophy after the repair of a recurrent hernia. In this series no mesh needed to be removed. Control of postoperative pain has not been a problem. There was no mortality.

The majority of the patients could return home the same day. Our rate of unplanned admission could be explained considering the case-mix of hernias (primary and recurrent) and that we have had a high percentage of admission for social reasons due to long travelling distances and problems related to changes in patients' preferences after the operation. In these cases the patients are not obliged to go home the same day.

Time off work is another important criteria in order to evaluate the efficiency of hernia repair. This has not been addressed very often in clinical publications in Spain. A multicenter study in 1994 showed an average of 58 days off work for ambulatory operated inguinal hernia patients and 69 days for inpatients [17]. Our results show a trend towards earlier return to full activities, although they are a little disappointing with respect to other studies [18]. Resumption of activity is not associated with an increase in the recurrence rate, being more related to several factors such as type of work, motivation and attitudes to recovery of the surgeons, patients and general practitioners [19,20]. As there is no scientific reason to restrict physical activity after hernia repair, the advice of surgeons and general practitioners given to the patients—encouraging activity—has a major influence on the recuperation of the patient.

In our series, the overall recurrence rate has been 2.2% (0.7% for primary and 5.2% for recurrent hernias) with an average follow-up duration of 36.4 months. This recurrence rate for a DGH with a DSU is acceptable, even taking into account possible objections to the follow-up rate. It compares favourably with multicenter figures for recurrence of 13% [2]. However, the recurrence rate following recurrent hernia repair is high, perhaps due to a late adoption of the 'plug' repair technique. In future, our aim will be to reproduce the results of specialist hernia surgeons approaching <1–2% recurrence rates [18,21,22] and to improve our follow-up rate.

An indirect measure of the process of improvement of hernia repair in our DGH, is that our current re-operation rate (percentage of operated recurrent hernias) is 7% which compares favourably with rates of 17% in 1992 [23].

We conclude that, in our DSU, an open mesh repair with local anaesthesia as a day case is the procedure of choice because of simplicity, and low complication and recurrence rates. It is well accepted by patients and surgeons. Its widespread application has had a positive impact on cost-effectiveness in our hospital, allowing greater patient turnover in the DSU operating rooms, shorter waiting times, and leading to an important improvement in the quality of care.

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