

Anesthesia and surgical repair of aponeurotic hernias in ambulatory surgery

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Received 19 January 2000; received in revised form 30 January 2000; accepted 26 March 2000

Abstract

The aim of this study was to evaluate our 5 year experience in the surgery of umbilical (UH) and epigastric hernias (EH) on an ambulatory basis. Sixty three point seven of UH (88/138) and 68.4% of EH (13/19) could be successfully operated in our ambulatory unit. Morbid obesity, ASA III-IV and insulin dependent diabetes were exclusion criteria. After a preoperative local anesthesia infiltration with 1% lidocaine a repair was undertaken in all 101 patients under monitored anesthesia care. Most patients underwent a mesh hernioplasty as definite treatment. Only three patients could not be discharged on the day of operation. There has been a 2% recurrence rate in long term follow-up. These results demonstrate that two thirds of primary aponeurotic hernias can be satisfactorily operated on ambulatory basis. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Umbilical hernia; Epigastric hernia; Local anesthesia; Ambulatory surgery

1. Introduction

The umbilicus is a cutaneous scar attached to a fibrous ring. This area of the anterior abdominal wall is weak and a common site of acquired hernias, as a consequence of a rise in intraabdominal pressure and deterioration of connective tissue [1,2]. The estimated prevalence of umbilical hernias (UH) in the adult population is 2% [3]. Epigastric hernias (EH) arise in defects in the midline aponeurosis as a consequence of alterations in the fascial fibers decussations [4]. The risk of incarceration and strangulation in patients with midline primary hernias requires elective surgical repair to prevent these complications [5]. Although most of UH in these patients are thought to need general anesthesia and hospital admission, the introduction of new anesthetic agents (propofol, sevoflurane) and the advantageous application of tension-free repair to the inguinal defects suggested to us the possibility of operating on these patients in an ambulatory setting [6–8]. The aim

of our present study was to evaluate the results of a protocol of local anesthesia and sedation for the surgical treatment of EH and UH in an ambulatory unit.

2. Patients and methods

Patients underwent routine preoperative evaluation consisting of blood test, chest X-ray and electrocardiogram. Exclusion criteria included ASA III-IV classification, morbid obesity, insulin-dependent diabetes and social or housing problems. All the patients were admitted on the day of operation. Discharge of patients after elective hernia repair was scheduled for the evening of the day of surgery. Comprehensive and consistent information is provided at first consultation and a signed informed consent is obtained.

Local anesthesia and sedation were used. Before infiltration the patient was monitored and a peripheral vein accessed. Antibiotic prophylaxis was started 30 min before anesthesia infiltration with 1 g cefazolin. Thromboembolism prophylaxis was performed with subcutaneous enoxaparin in patients at risk, starting

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the night before surgery and for 7 postoperative days. The patient learned to self-administer this drug. Thirty milligrams ketorolac was used as initial analgesia, 30 min before anesthetic injection. A maximum of 60 ml solution of 1% lidocaine was usually enough to achieve a complete block of the umbilical or epigastric area. Neither bicarbonate nor vasoconstrictor were used. About 80% of the solution was injected before the skin incision.

Under monitored anesthesia care a single dose of midazolam (0.1 mg/kg iv) was given before local anesthesia infiltration. When analgesia was not sufficient or there was patient restlessness a continuous perfusion of propofol was administered. A laryngeal mask was used if respiratory depression occurred. Atropine was also usually utilized under anesthesia criteria, at normal doses.

Having approximately calculated the distance between skin and anterior fascia, progressive local anesthesia was performed from two points of injection (one above and one below the umbilicus). In order to avoid the needle introduction pain, ethyl chloride skin spray was used. Then an intraepidermal subumbilical wheal was infiltrated in the direction of the proposed line of the skin incision. With the help of a 20 or 22 G spinal needle, the dermal, subcutaneous tissue and fascia was progressively injected in an area surrounding the hernia defect. After 10 min the operation was started. The rest of the lidocaine solution was used to block the base of the sac and the border of the defect during the operation.

A semicircular subumbilical incision was preferred for UH and a short midline incision for EH. The content of the sac was usually reduced and only rarely resected. The sac was replaced in the abdominal cavity without resection when possible. This was performed in 64% of cases. When the sac was resected the peritoneum was closed with 2/0 absorbable polyglycolic acid sutures (Dexon®). The surgical repair techniques are shown in Table 1. Defects sized less than 1 cm diameter were surgically corrected with absorbable su-

tures (herniorrhaphy) in 16 (18.1%) of UH and in six (46.1%) of EH. Larger hernias were corrected with the application of a polypropylene (Premilene®) mesh. Most hernias were repaired with 'H hernioplasty' described elsewhere [9,10]. Subcutaneous tissue was closed with absorbable sutures (Dexon®) over a closed sump drain placed (in 38% of cases).

The patient was moved to a recovery room and a frozen dry plastic bag (ColdHot™, 3M) was applied over the wound dressing to diminish postoperative local inflammation. Oral intake was started after 2 h. Then, the patient was moved to an armchair in another room. After approximately 3–4 h the patient is invited to initiate walking. The patient's readiness for discharge was assessed using a postanesthesia discharge scoring system [11]. Before discharge, the patient was informed about possible postoperative complications and local wound care at home. The next morning the patient was telephoned to assure that the immediate postoperative outcome and the control of pain was satisfactory. A week later an ambulatory nurse visited the patient at home and removed the skin stitches and sump drain. The patients were followed up postoperatively at 6, 12, 24 and 36 months in the outpatient department.

3. Results

From January 1994 to January 1999, 157 patients with midline hernias have been operated in our department: 138 UH and 19 EH. Of these, 88 (63.7%) UH and 13 (68.4%) EH could be successfully operated on an ambulatory basis. Mean age was 46.1 ± 13.9 years (range: 18–86) and 43.6% ($n = 44$) were females. Mean body mass index (BMI) of patients included was 27.2 ± 0.75 (range: 17.3–41.5). There were several concomitant associated diseases in the patients undergoing ambulatory surgery: moderate obesity (BMI > 30) in 47 (46.5%), hypertension in 22 (21.1%), non-insulin dependent diabetes in ten (9.9%), chronic bronchitis in seven (6.9%) and cirrhosis in five (4.9%). Four of the patients with UH had a recurrent umbilical hernia (4.5%), and two had an umbilical hernia over a previous laparotomy scar.

There were no intraoperative surgical complications such as abdominal hemorrhage or evisceration. Vagal bradycardia was the most frequent anesthetic event (7.9%) successfully corrected with atropine iv. Five cases of intraoperative hypertension were recorded and treated with sublingual nifedipine. There was one case of local anesthetic toxicity with mild symptoms at the beginning of our study that was be successfully managed. Mean operative time was 49.7 min (range: 24–110).

There was no mortality. There were few postoperative complications: nine seromas (8.9%), two he-

Table 1
Surgical techniques applied to hernia repair

	Umbilical (%)	Epigastric (%)
<i>Herniorrhaphy</i>		
Simple closure	11 (12.5)	5 (38.4)
Queno	1 (1.1)	1 (7.7)
Mayo	4 (4.6)	
	16 (18.1)	6 (46.1)
<i>Hernioplasty</i>		
H hernioplasty	69 (78.4)	6 (46.1)
Preperitoneal	1 (1.1)	1 (1.1)
Preaponeurotic (Onlay)	2 (2.2)	
	72 (81.8)	7 (53.8)

matomas (1.9%), one wound infection (0.9%). All the seromas were treated by simple drainage on an ambulatory basis. Mean postoperative time before discharge was 7.2 h. Three patients could not be discharged on the day of operation (2.9%): one patient with social problems, one patient with nausea, vomiting and general discomfort and one patient with immediate postoperative hematoma that had to be surgically drained. All of them were finally discharged before the third postoperative day.

With a mean follow-up of 70 months (range: 6–55) in 95% of patients, there has not been any case of chronic pain, foreign body reaction or infection after the use of a mesh. There were two cases of recurrent hernia, one after simple closure and one after H hernioplasty.

4. Discussion

Adult umbilical and epigastric hernias have not received so much attention in the recent literature as other defects of the abdominal wall. While inguinal and crural hernias are commonly repaired in one day surgery programs, ambulatory repair of aponeurotic hernias remains controversial. There is a serious risk of incarceration in umbilical hernias with a high associated morbidity and mortality [12,13]. Thus elective repair is nearly always indicated [5].

With experience our selection criteria in our series have become more flexible. This has allowed us to operate on 63.7% of UH and 68.4% of EH as day cases. This has been achieved by proper local anesthesia and surgical techniques by the surgeon and careful monitored care by the anesthetist.

Obesity may be defined as a body mass index over 27. This was the case in 54% of patients in our series. Obesity is frequent among patients with UH, especially middle-aged multiparous women [14]. Moderate obesity was an exclusion criterion at the beginning of our series, but later some patients with this were included. Those cases in which the distance between skin and fascia was felt to be shorter than 5 cm were selected to be operated on an outpatient basis. Patients with morbid obesity were always treated as inpatients.

Elderly patients were included. In our experience, this age group tolerates local anesthesia better than younger groups. Elective local anaesthetic surgical repair is particularly advantageous in patients older than 65 years [15].

Local anesthesia has several advantages: rapid recovery in the immediate postoperative period ('a painless patient is a quiet patient'), less surgical stress, and avoid general anesthesia like nausea, vomiting and severe sedation. Oral intake can be started early and the patients become autonomous sooner than following a

general anesthetic. The main but infrequent disadvantages of local anesthesia are anxiety, toxicity and ineffective surgical repair. Only one case of mild toxicity was recorded in our series.

There are two possible local anesthetic techniques: a progressive complete anesthesia block that is achieved preoperatively [16,17], or administration following each operative step: skin, subcutaneous tissue, sac and rectus sheath [6]. In our group the first is our choice in order to avoid patient sensitivity to pain when a surgical area without infiltration might be entered. With either option, local anesthesia can be accomplished with confidence after sufficient experience [18]. Not only is this method useful for ambulatory surgery units but also for patients with diseases that contraindicate general or spinal anesthesia: dilated cardiomyopathy, severe chronic bronchitis, cirrhosis etc. In our department even a patient with a strangulated umbilical hernia that required an intestinal resection was successfully operated with local anesthesia block.

Another important issue in the success of ambulatory surgery for EH and UH is the use of mesh. Simple closure of the defect with sutures or the use of overlapping procedures in large defects shorten the longitudinal diameter of the midline, generates tension and may seriously affect the mobility of the anterior abdominal wall [4]. The use of a mesh replacing the defect avoids tension sutures to approximate the separated borders and therefore, is suitable to be used in these midline hernias. This becomes more relevant when patients are programmed to be discharged on the day of operation.

There are different locations to lay on the mesh at the umbilical ring [19]. The surgical repair with mesh designed by Celdrán et al is our preferred choice for UH and EH [9]. With this method the anterior surface of the fascia 2 cm around the ring is explored in order to exclude other paraumbilical defects [4]. There is not an extensive dissection of the preperitoneum (only superior and inferior borders) and this is easily achieved under local anesthesia. Although there is lack of agreement in the scientific community about what kind of biomaterial should be used for hernia repairs [20], our results with the use of polypropylene mesh are encouraging.

Seromas are the result of the dissection of anterior fascia from the subcutaneous tissue and the application of the mesh. The high rate of seromas in the series is attributable to the infrequent use of drains in these patients. Now we almost routinely employ soft sump drains. Patients are properly instructed in care of the wound and drain at home. These drains, together with the skin staples, are usually removed at the eighth postoperative day.

Our 2% recurrence rate is a real success for these patients. Although there is a lack of evidence based surgery on UH and EH, the reported recurrence rates after herniorrhaphies are as high as 27% [2,10].

In conclusion, almost two thirds of patients with UH and EH defects can be safely operated on an ambulatory basis using local anesthesia. This procedure avoids complications associated with general or spinal anesthesia and saves hospital admission costs. The application of tension-free hernioplasty, that has been successfully applied to the myopectineal ring, provides an excellent tool to repair these aponeurotic hernias on a day surgery basis.

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