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<b>Citation</b>	<b>Hong Kong Medical Journal, 2000, v. 6 n. 2, p. 218-220</b>
<b>Issued Date</b>	<b>2000</b>
<b>URL</b>	<b><a href="http://hdl.handle.net/10722/45406">http://hdl.handle.net/10722/45406</a></b>
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# An audit of the early outcomes of ambulatory inguinal hernia repair at a surgical day-care centre

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Ambulatory surgery has been recently gaining popularity owing to the increasing constraints on public-sector health care resources. Inguinal hernia repair is one of the most common day-case operations. This study was conducted to audit the early outcomes of 271 consecutive day-case inguinal hernia repairs performed at the Day Surgery Centre of the Tung Wah Hospital from 1 December 1995 to 31 December 1998. No patients died on the day of their surgery; in 265 (97%) cases, patients were discharged home on the day of their operation. Two patients required readmission because of fever and urinary retention, and the postoperative morbidity rate was approximately 5% (14/271 cases). Wound complication was the most common morbidity encountered and pain was the most common discomfort experienced by patients at home. These results suggest that ambulatory hernia repair can be performed safely in a day centre and yields excellent early outcomes.

*HKMJ 2000;6:218-20*

*Key words: Ambulatory surgical procedures; Hernia, inguinal/surgery; Morbidity; Treatment outcome*

## Introduction

Hernia is a common medical problem and inguinal hernia repair is one of the most common operations performed in the world.<sup>1</sup> Hernia repair is particularly suitable for day-case operation, as the procedure can usually be accomplished within 1 hour.

The Day Surgery Centre at the Tung Wah Hospital (TWH) was established in 1995. The centre has substantially enhanced the efficiency and quality of patient care given by the hospital. The waiting time for hernia repair has shortened from a few months to a few weeks. Despite the early discharge of patients, safety issues and patient satisfaction remain prime concerns. The present study was undertaken to audit the early outcomes of the inguinal hernia repairs performed at the Day Surgery Centre during its first 3 years. We also evaluated the problems encountered by patients during their recovery at home. The study was intended to identify potential areas for further improvement of the clinical service.

## Methods

From 1 December 1995 to 31 December 1998, 271 ambulatory inguinal hernia repairs were performed at the TWH Day Surgery Centre. All medical records were reviewed. The treatment outcome, and post-operative morbidity and mortality rates were analysed.

### *Patient selection*

The selection criteria used to choose the 259 patients for day-case surgery are shown in the Box. All selected patients were required to attend a pre-anaesthetic assessment clinic. During this consultation, each patient was assessed by a specialist surgeon. In addition, the patient's medical fitness for general anaesthesia and social suitability for day-case operation were evaluated by an experienced anaesthetist and a nurse specialist, respectively. An appointment for operation was then given to the patient.

### *Day of operation*

All patients were admitted on the day of operation after fasting from midnight. The procedures were scheduled for the morning session and all patients were operated on under general anaesthesia. The operative methods included using nylon darn (n=169), the Bassini method (n=62), polypropylene mesh hernioplasty (n=36), iliopubic tract repair (n=2), and herniotomy with Lytle's repair of the deep inguinal ring (n=2). The operative findings were direct inguinal hernia (n=78),

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**Selection criteria to choose patients for day-case hernia repair**

- (1) ASA\* I or II
- (2) Non-obese
- (3) No adverse anaesthetic history
- (4) Operation time <90 minutes
- (5) Operation unlikely to cause loss of independence or toilet function
- (6) Operation unlikely to cause severe morbidity, haemorrhage, or pain
- (7) No special care required postoperatively
- (8) Informed consent given to day surgery
- (9) Patients lives within 1 hour's travel of the hospital
- (10) Home has access to telephone, lift, indoor toilet, and bathroom
- (11) Competent adult is available to accompany patient home and to look after the patient for 24 hours

\* ASA American Society of Anesthesiologists risk classification

indirect inguinal hernia (n=179), sliding hernia (n=3), recurrent direct inguinal hernia (n=3), and pantaloon inguinal hernia (n=8). Local infiltration of the wound with approximately 10 mL of 0.25% bupivacaine was routinely performed before wound closure.

**Follow-up**

After being assessed by the operating surgeon and anaesthetist, patients were discharged in the afternoon. All patients were given a supply of oral dextropropoxyphene 32.5 mg and a suppository of diclofenac sodium 50 mg for pain relief, and were accompanied by a competent adult on discharge. A 24-hour hotline was available for patients in case any problems developed. Telephone follow-up calls to check on the patient's condition were made by the nurse specialist on postoperative days 1 and 3. Problems that were encountered by the patient on their way home and over the following 3 days were documented. The severity of pain experienced was assessed by plotting a linear analogue pain score on a scale from 0 to 10. Under a shared-care programme with selected primary health care physicians, some patients (n=16) were referred back to their doctors for follow-up. Other patients were reviewed at the general surgical out-patient clinic at the TWH, 1 to 2 weeks after the operation.

**Results**

There were 240 men and 19 women involved; their ages ranged from 15 to 72 years (mean age, 48 years). Eleven patients with bilateral inguinal hernias underwent staged repairs and only one patient had a simultaneous repair of both hernias. In most cases (265/271; 97.8%), the patients were discharged uneventfully after surgery. Six (2.3%) of the 259 patients were assessed as being unfit for discharge on the day of operation. The reasons for non-discharge included

pain (n=3), dizziness (n=2), and haemoptysis (n=1). Of the three patients who complained of pain, one had undergone repair of a large scrotal hernia and omentectomy, while another had undergone bilateral inguinal mesh hernioplasty. No mortalities occurred.

Six patients defaulted follow-up after being discharged home. Complications occurred in 14 cases, leading to a morbidity rate of approximately 5% (Table 1). Two cases required readmission because of postoperative fever (n=1) and urinary retention (n=1); the readmission rate was 0.7%. Telephone follow-up data were available for 257 (95%) of the 271 hernia repairs: 41 patients experienced problems on their way home—namely, pain (n=27), nausea and vomiting (n=8), dizziness (n=5), and bleeding (n=1). The mean pain score was 3.5 (standard deviation [SD], 1.9) and 1.9 (SD, 1.5) on postoperative days 1 and 3, respectively. Other problems experienced by the patients when at home are listed in Table 2.

Follow-up was calculated from the date of the operation. It ranged from 1 to 28 months with a mean follow-up interval of 2 months. Of the two patients who had a wound abscess after the hernia repair, one had a recurrence of hernia and required surgical repair again 10 months after the initial operation. The short-term recurrence rate of inguinal hernia was thus 0.4%.

**Discussion**

Inguinal hernia is the most common abdominal wall pathology that requires surgical intervention.<sup>2</sup> For

**Table 1. Complications of day-case inguinal hernia repair surgery**

Postoperative morbidity	Cases, n=271 No. (%)
Haematoma/bruising	5 (1.8)
Scrotal swelling	2 (0.7)
Wound abscess	2 (0.7)
Fever	2 (0.7)
Cellulitis	1 (0.4)
Reactivation of hepatitis	1 (0.4)
Urinary retention	1 (0.4)
Total	14 (5.2)

**Table 2. Discomfort experienced by patients on days 1 and 3 after surgery**

Symptom	No. of patients	
	Day 1	Day 3
Pain	56	11
Nausea and vomiting	2	0
Dizziness	2	0
Anxiety	2	0
Total	62	11

example, more than 300 000 hernia repairs are performed annually in the United States alone.<sup>3</sup> With the establishment of the Day Surgery Centre at the TWH, the number of ambulatory inguinal hernia repairs performed has been increasing. For patients, the stress and inconvenience of hospitalisation are avoided,<sup>4</sup> while for the hospital, day surgery has proven to be a cost-effective means of giving patient care,<sup>5-7</sup> as in-patient beds can either be closed or released for use by acute patients. Day surgery also helps shorten the waiting time for hernia repair.

The morbidity rate of 5% in this study compares favourably with the results of overseas centres.<sup>8-13</sup> Most of the minor complications, such as bruising, did not retard the recovery process of patients. During follow-up, only one patient, who had a history of wound abscess after the hernia repair, had a recurrence of hernia. Wound complications, particularly haematoma and bruising, are by far the most common causes of morbidity.<sup>14</sup> Haematoma formation predisposes the wound to infection and to a recurrence of hernia. Cautious surgical dissection and meticulous haemostasis prior to wound closure could help to minimise this complication.

Two patients required readmission to hospital because of postoperative fever and retention of urine. These complications seemed to be inevitable. The relatively low readmission rate of 0.7% could be explained by our strict selection criteria when choosing patients for ambulatory surgery.<sup>4,5</sup> The availability of a 24-hour telephone hotline after surgery allows for urgent consultation with patients in case of any emergency. This after-care service reduces patient anxiety and ensures the safety of patients.

Wound pain was the most troublesome postoperative discomfort following inguinal hernia repair. A combination of oral opioid analgesic and non-steroidal anti-inflammatory drug seemed to be satisfactory analgesic agents without noticeable side effects.<sup>15,16</sup> Most patients remained relatively pain-free and managed well at home. Of the 56 (21.6%) patients who reported wound pain on telephone follow-up, only five found these drugs ineffective. However, pain management still has potential for improvement. Novel means of pain relief, such as the continuous infusion of local anaesthetic into the wound, have been advocated but remain experimental.<sup>17</sup> Adequate pain control helps enhance patient satisfaction.

Our results prove that ambulatory inguinal hernia repair is safe and effective, and the early results are encouraging. With the escalating cost of health care, further development and expansion of the ambulatory surgery service is anticipated. Success of day surgery relies on careful patient selection, skillful operative techniques, safe anaesthesia, and adequate postoperative care. Continuing audit is essential to maintain and improve the quality and standard of ambulatory surgery provided.

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