Over a thousand ambulatory hernia repairs in a primary care setting

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ABSTRACT

INTRODUCTION This paper outlines the development and feasibility of a dedicated ambulatory primary care hernia service and examines the outcomes achieved during the period 1 March 2005 to 31 December 2008.

PATIENTS AND METHODS A prospective analysis of 1164 patients who underwent abdominal wall hernia repair at Probus Surgical Centre during the study period. The operations were carried out by two GPs with a special interest (GPwSI) and one retired surgeon. The techniques used were a Lichtenstein mesh repair or modified Shouldice repair for inguinal hernias and a primary sutured repair for ventral hernias. All procedures were performed as day-cases under local anaesthesia without sedation. All patients were reviewed routinely at 6 weeks. The primary outcomes of the study were recurrence and patient satisfaction levels, and complications such as infection, haematoma and chronic pain.

RESULTS No patient required conversion to general anaesthesia. There were three (0.3%) recurrences. Complication rates were low and similar to those obtained in other specialist hernia units. More than 90% of patients were satisfied with the service and would recommend it to a friend.

CONCLUSIONS Routine elective abdominal wall hernia repairs can be performed in a primary care setting, safely and with excellent outcomes.

KEYWORDS

Primary care – Hernia repair – Local anaesthesia

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Approximately 100,000 hernia repairs are performed in the UK annually, the vast majority in hospital usually under general anaesthetic.¹ In the early 1990s, the waiting time in the UK for routine elective groin hernia repairs in the NHS had become unacceptably high (<www.18weeks.nhs.uk>) with NHS patients waiting times as long as 2 years for an operation. The prolonged wait had a marked effect on patient quality of life and increased the risk of urgent admission and emergency surgery^{2,5} resulting in further pressure on operation lists and reducing the availability of in-patient beds for elective major operations.^{4,5}

In recent years, the pressure on hospital facilities, with increasing waiting times for non-emergency surgery for benign conditions has increased. Alternatives to in-patient and hospital-based surgery have been explored and the feasibility of performing hernia surgery in a general practice setting has already been shown.^{6,7} It was in this context that the Probus Surgical Centre in Cornwall, UK was set up in 2005 in order to offer hernia repair to our patients, the main stimulus being to reduce prolonged waiting times. A secondary aim was to relieve the pressure on local hospital

waiting lists for other surgical procedures. This article reviews our experience with ambulatory hernia repair in a primary care facility of more than 1000 cases over a period of 3 years.

Patients and Methods

All of the mesh hernia repairs were carried out by one of two general practitioners with a special interest (GPwSI) and tissue repairs by the associate surgeon. Patients were referred by their own GPs and were seen within 4 weeks. Surgical and anaesthetic options were discussed with the patient; if deemed suitable for local anaesthetic repair, they were given detailed written information about the procedure and postoperative management and offered a date for surgery. Age and co-morbidity were not regarded as contraindications as long as the patient had appropriate home support with a responsible adult. Exclusion criteria are listed in Table 1. There are no facilities for conversion to general anaesthesia and all procedures were performed using local anaesthetic only – with no sedation. A suitably

Table 1 Exclusion criteria for primary care local anaesthetic ambulatory hernia repair

Age less than 18 years
Patient-specific preference for general anaesthesia
Unstable mental health problems
Unable to stop anticoagulation for 5 days pre-operatively
Known hypersensitivity to local anaesthetic agents
Active MRSA infection

equipped cardiac arrest trolley and defibrillator were available, and all senior clinical staff were trained in resuscitation techniques.

On the day of operation, patients were admitted by a nurse who carried out a protocol-based pre-operative check. Pre-operative investigations were not carried out routinely, but only if there were clinical indications.⁸ The operating surgeon confirmed the procedure with the patient, obtained written consent and marked the operation site, following which the patient walked to the operating room. Operating room staff were the surgeon and two nurses, one scrubbed as an assistant and the other as a 'runner', whose additional function was to watch the patient and engage him or her in conversation. No sedation was administered and no monitoring equipment was used. The surgeon injected local anaesthetic using a standard infiltration technique. Inguinal hernias were repaired using Lichtenstein's open onlay mesh repair technique⁹ or a Shouldice tissue repair, depending upon surgeon preference. Ventral hernias were repaired by a non-absorbable suture if the defect was smaller than 2 cm. For defects larger than 2 cm, a 'plug-and-patch' PHSE mesh was inserted. At the end of the procedure, patients walked to the recovery

area for a drink and light refreshments. They and their adult carer were given verbal and written instructions prior to discharge from the unit, usually within 30 min of the completion of the operation. They were also given a patient satisfaction questionnaire.

All patients were telephoned by a nurse on the evening of the operation and seen by their own practice nurses at 7 days for dressing removal. Patients were sent the patient satisfaction questionnaire (Table 2) 4 weeks after operation and all were reviewed by the operating surgeon at 6–8 weeks.

Results

Over a 46-month period from 1 March 2005 to 31 December 2008, 1164 hernia repairs were carried out. This represented 98% of all referred patients and all were operated on under local anaesthetic at our centre within 16 weeks of referral. The age range was 18–95 years and 1097 (94%) were men. Some 343 (29%) of patients were over 70 years old and 85% of these had multiple pathologies, including ischaemic heart disease, severe respiratory disease, cancer and diabetes.

Most hernias were unilateral primary but there were 44 recurrent hernia repairs – 41 previous non-mesh and three previous mesh repairs, all formerly carried out elsewhere. Some 848 patients had an open onlay mesh repair (Lichtenstein technique) and 200 patients had a Shouldice repair.

Short-term results

There were no significant adverse intra-operative events. There were three clinically significant haematomas. One was drained in hospital and the patient required an overnight stay. The other two haematomas were managed conservatively and resolved over a period of 6 months. One patient with persistent wound bleeding was admitted to

Table 2 Patient questionnaire

	Yes (%)	No (%)
Was the information given before the operation adequate?	98	2
Were you happy with the overall care received on the day of the operation?	100	0
Would you recommend a hernia operation under local anaesthesia to your friends	95	5
Please indicate your overall satisfaction with the service provided (score 1–10)		
10	91	
9	8	
8	1	
7 or below	0	

Received questionnaires 826 (71%).

hospital for overnight stay, the bleeding stopped with a compression dressing.

In one case, the small bowel was perforated at dissection in a densely adherent sac in an elderly patient. The bowel was repaired and the patient transferred to hospital for observation. He made an uneventful recovery and was discharged at 1 week. One patient had a superficial wound infection which responded to antibiotic treatment.

Medium- and long-term results

Two patients (0.2%) complained of prolonged postoperative pain (longer than 3 months). They both improved after a course of oral non-steroidal anti-inflammatory analgesics and local injections of bupivacaine. There were three recurrences, all noted by the patients and their referring GPs after the initial follow-up at 6 weeks. Direct hernia sacs were found in two recurrences – one following an onlay mesh repair (due to inadequate mesh placement on the medial aspect) and the other following Shouldice repair. The third recurrence revealed an indirect sac in the 'lateral triangle' due to inadequate suture holding the 'mesh tails'. All recurrences were corrected and no further problems were noted in these patients. Follow-up of asymptomatic patients beyond 12 months was not entertained, as we believe that these would have been re-referred to us by their respective GPs. No further recurrences have self-presented. Patient reported satisfaction, detailed in Table 2, was uniformly high.

Discussion

Inguinal hernia repair is a significant cost burden for healthcare systems already under financial pressure.^{10,11} The lowest cost to society of inguinal hernia repair is local anaesthetic ambulatory repair,^{10–12} yet surgeons in the UK have been slow to adopt it for reasons that are not entirely clear.^{13,14}

The overall outcome of hernia repair has been shown to improve in a dedicated hernia service in an NHS general hospital but this still requires the use of hospital facilities.¹⁵ In 1996, a UK Department of Health publication outlined a vision for the provision of surgical services in the community.¹⁶ It recognised the need to provide a secondary care service in a primary care setting and set out the essential requirements for such a service: a GP with the experience and qualifications to undertake the procedure and availability of suitable equipment and facilities.

Probus Surgical Centre was established in 2005 with this framework in mind. In 2006, the *Your Health Your Care Your Say* White Paper¹⁷ and the *Care Closer to Home*¹⁸ projects were launched. NHS demonstration sites, of which the Probus Surgical Centre was one, were evaluated by external assessors who concluded that the project was feasible as

Table 3 Complications

Recurrences	3
Haematoma	3
Bowel perforation	1
Wound bleeding	1
Conversions to general anaesthesia	0
Urinary retention	0
Mesh infection	0
Superficial wound infection	1
Hydrocoele	1
Chronic pain	2
Testicular pain	0
Mortality	0

long as governance issues such as appropriately trained staff and standardisation of care were at least equal to those in an NHS hospital facility.

Our data show that the Probus Surgical Centre met these quality standards. Recent estimates,^{5,19} based on a large UK population study, have quoted a 10% incidence of significant wound infection or haematoma, and a 5–10% recurrence rate. Set against this background, our results (Table 3) are highly acceptable, and are similar to those reported from specialist hernia centres and dedicated units.²⁰

We elected to repair all hernias under unmonitored local anaesthetic. This has been shown to be both safe and cost effective in large series of patients.²¹ In our series, correct and accurate assessment of both patient and hernia, along with adequate pre-operative counselling,²⁰ meant that there was never a need to abandon the procedure.

In addition, the routine use of local anaesthetic meant that we could operate on elderly or medically unwell patients, otherwise considered unfit for surgery. There is abundant evidence that many elderly patients may be turned down for elective groin hernia repair because of a perceived operative risk and, as a result, run the risk of strangulation and an impaired quality of life.^{22,23}

Patient satisfaction level was very high (Table 2) with over 90% of patients happy to recommend a similar local anaesthetic repair to a friend. While we accept the limitations of this type of questionnaire, seeking patient's views on the outcome of their procedure is an important feature of modern-day healthcare provision.²⁴ Our detailed information sheets outlined options, alternatives, likely postoperative course and an estimate of time to return to normal activity. Patient satisfaction can be significantly improved by the provision of good, written, pre-operative information,²⁵ and the converse also applies.²⁶

If this model of care is to be sustainable, the training of a future workforce is essential and this could be obtained from the large numbers of adequately trained surgical trainees who cannot, or do not choose to, become consultants in the NHS. Both appropriate skills and adequate infrastructure are vital for delivery of such a service^{6,18} and the educational pathway for acquisition of these skills would need to be formalised. It is possible that the primary care setting itself could be used for training but this would require 'trainers' and significant financial input. The Association of Surgeons in Primary Care (ASPC; <<http://www.aspc-uk.net>>) was formed to promote, educate and train surgical services in the community. While accreditation systems are already in place, a robust, competence-based, accreditation process needs to be instituted as outlined in the recently published accreditation guidance for GPwSI²⁷ to ensure safe, high-quality delivery of healthcare in a relatively unsupervised primary care setting. This report also addresses the issue of quality of service and patient satisfaction.

Conclusions

This study has shown that it is feasible for routine elective abdominal wall hernia repairs to be performed in a primary care setting – safely and with excellent outcomes. There are clear economic benefits once the system is established. Whether or not this model can be extended to other centres would depend on the availability of motivated trained surgeons and sufficient funds to initiate the service.

References

1. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. *Lancet* 2003; **362**: 1561–71.
2. Alvarez JA, Baldonado RF, Bear IG, Solis JA, Alvarez P, Jorge JI. Incarcerated groin hernias in adults: presentation and outcome. *Hernia* 2004; **8**: 121–6.
3. Gianetta E, de Cian F, Cuneo S, Friedman D, Vitale B, Marinari G *et al*. Hernia repair in elderly patients. *Br J Surg* 1997; **84**: 983–5.
4. Department of Health. *Shifting Care Closer to Home – report of the speciality subgroups*. London: DH, 2007.
5. Hair A, Duffy L, McLean J, Taylor S, Smith H, Walker A *et al*. Groin hernia repair in Scotland. *Br J Surg* 2000; **87**: 1722–6.
6. Dhumale R. Feasibility study of hernia surgery in general practice setting. *Br J Gen Pract* 2004; **54**: 604–7.
7. Lafferty PM, Malinowska A, Pelta D. Lichtenstein inguinal hernia repair in a primary healthcare setting. *Br J Surg* 1998; **85**: 793–6.
8. National Institute for Health and Clinical Excellence. *Clinical Guideline 3. Pre-operative tests. The routine use of pre-operative tests for elective surgery*. London: NICE, 2003.
9. Amid PK, Shulman AG, Lichtenstein IL. Local anesthesia for inguinal hernia repair step-by-step procedure. *Ann Surg* 1994; **220**: 735–7.
10. Millikan KW, Deziel DJ. The management of hernia. Considerations in cost effectiveness. *Surg Clin North Am* 1996; **76**: 105–17.
11. Nordin P, Nilsson E. Cost-effectiveness local, regional and general anaesthesia. *Br J Surg* 2007; **94**: 500–5.
12. Callesen T, Bech K, Kehlet H. The feasibility, safety and cost of infiltration anaesthesia for hernia repair. *Anaesthesia* 1998; **53**: 31–5.
13. Ciampolini J, Shandall AA, Boyce DE. Adult hernia surgery in Wales revisited; impact of the guidelines of The Royal College of Surgeons of England. *Ann R Coll Surg Engl* 1998; **80**: 335–8.
14. Kehlet HA, Aasvang E. Groin hernia repair: anaesthesia. *World J Surg* 2005; **29**: 1058–61.
15. Kingsnorth AN, Bowlwy DMG, Porter CS. A prospective study of 1000 hernias: results of the Plymouth Hernia Service. *Ann R Coll Surg Engl* 2003; **85**: 18–22.
16. Department of Health. *A National Framework for the Provision of Secondary Care within General Practice*. HSG (96)31. London: DH, 1996.
17. Department of Health. *Your Health Your Care Your Say*. London: DH, 2005 <http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4127357>.
18. Department of Health. *Shifting Care Closer to Home – report of the speciality subgroups*. London: DH, 2007.
19. O'Dwyer P, Norrie J, Alani A, Walker A, Duffy F, Horgan P. Observation or operation for patients with an asymptomatic inguinal hernia. *Ann Surg* 2006; **244**: 167–73.
20. Kingsnorth A, Porter C, Bennet DH. The benefits of a hernia service in a public hospital. *Hernia* 2000; **4**: 1–5.
21. Callesen T, Bech K, Kehlet H. One-thousand consecutive inguinal hernia repairs under unmonitored local anesthesia. *Anesth Analg* 2001; **93**: 1373–6.
22. Davies M, Davies C, Morris-Stiff G, Shute K. Emergency presentation of abdominal hernias: outcome and reasons for delay in treatment – a prospective study. *Ann R Coll Surg Engl* 2007; **89**: 47–50.
23. Primates P, Goldacre MJ. Inguinal hernia repair: incidence of elective and emergency surgery, readmission and mortality. *Int J Epidemiol* 1996; **25**: 835–9.
24. Marshall SS, Haywood KL, Fitzpatrick R. Impact of patient reported outcome measures on routine practice: a structured review. *J Eval Clin Pract* 2006; **12**: 559–68.
25. Mehta S, Powell L, Cooper JC. What patients really want to know about their surgery. *Bull R Coll Surg Engl* 2003; **85**: 360–3.
26. Jaffer U, Elmgrove A, Wilding R, Cameron AE. Audit of patient experience of day-case inguinal hernia repair. *Hernia* 2008; **12**: 79–82.
27. <[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications.\(2007\)](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications.(2007))>.