

The Treatment of Inguinal Hernia in the Elderly: Under Local Anesthesia

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Abstract

Introduction: Inguinal hernia (IH) in the elderly is a quite common problem in general surgery. One should be aware about surgical treatment of the cardiovascular and respiratory pathology of these patients as they are often affected. Also an important goal of surgery is it should lead to functional recovery after the operation using the “tension free” technique and, whenever possible, local anesthesia (LA).

Aim: Aim of this study is a better definition of the indications to surgery and anesthesia and verifying the results of surgical treatment.

Materials and Methods: From January 1999 to December 2002, our group operated 317 patients with IH; 123 patients were over 65 (119 males and 4 females, age from 65 to 101 years, mean 74); in this group, 111 Lichtenstein and 12 Trabucco HPL were performed. There were 89 primitive hernias, 17 recurrences, and 17 emergency operations. LA was the method of choice except for obese patients, obstruction or strangulation, or patient’s preference. In giant hernia, or when a large sac was found, the Wantz technique was performed (13 patients); a suction drainage was used if a large space in the inguinoscrotal area remained after hernia reduction (9 patients).

Results: LA was used in 87 patients, spinal in 31 and 5 in general; there were no post-operative deaths. Local complications were 4 inguinal hematomas, 2 hematomas and 2 transient edemas of the scrotum, 1 wound infection, 1 seroma of the wound, and 1 scrotal seroma (9%); all patients recovered after few days of medical therapy. No cases of ischemic orchitis occurred.

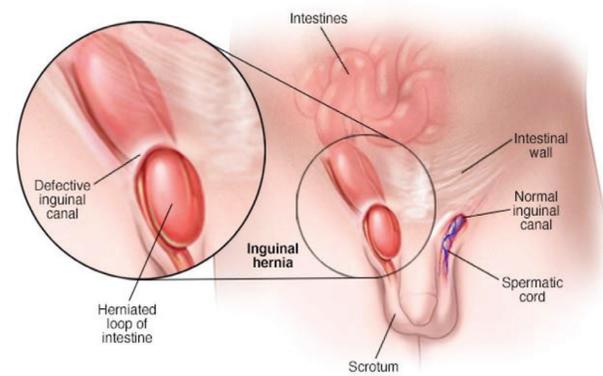
Conclusion: Inguinal herniorrhaphy can be safely performed, in elderly patients; according to personal experience, LA proved to be a safe technique, also in patients with cardiocirculatory problems. Local complications were mild and more frequent in patients “over” 65 years (13% vs. 6%, in “under” 65), but recurrent hernias make the difference; a suction drainage can reduce the problems caused by a fluid collection in the inguinoscrotal area. Wantz technique reduces the operative time and, according to personal opinion, contributed to lower ischemic testicular complications to zero.

Key words: Elder, Inguinal hernia, Local anesthesia

INTRODUCTION

An inguinal hernia (IH) occurs when tissue, such as part of the intestine, protrudes through a weak spot in the abdominal muscles. The resulting bulge can be painful, especially when you cough, bend over or lift a heavy object.

An IH is not necessarily dangerous. It does not improve on its own, however, and can lead to life-threatening



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complications. Your doctor is likely to recommend surgery to fix an IH that's painful or enlarging. IH repair is a common surgical procedure.^[1-4]

BACKGROUND

Local anesthesia (LA) is one of the most commonly used anesthetic methods in IH repair.^[5-7] LA is recommended for IH repair in elderly patients and patients with comorbidities (Grade C) by the Association of Surgeons of Great Britain and Ireland.^[8] Moreover, the European Hernia Society Guideline (EHS) recommended that patients with the American Surgical Association (ASA) pre-operative evaluation of Grade 3 or 4 can consider day surgery with LA. However, young anxious patients, with morbid obesity, incarcerated hernia should be excluded from operation under LA.^[9-14]

From 2008, our hospital started to perform IH repair under LA. Compared with general anesthesia (GA), LA showed increased safety, better post-operative pain control, less post-operative complication, shorter recovery period, and reduced cost. Since 2010, our hospital has begun to perform emergency hernia surgery under LA. The aim of this study is to investigate the safety and effectiveness of LA in an emergency IH surgery by evaluating related outcomes.^[15-18]

The two incidences and prevalence of IH worldwide are unknown. The etiology of IH is a by-product of genetic environmental and metabolic factors, combined with individual patient factors that can vary overtime such as activity level, immune status, infection, medications, personal habits (ex-smoking), and change in body mass index (BMI). Laparoscopy studies have reported rates of contralateral defects as high as 22% with 28% of those going on to become symptomatic during short-term follow-up. The male-to-female ratio is >10:1. Lifetime prevalence is 25% in men and 2% in women; two-thirds of IH is indirect; nearly two-thirds of recurrent hernias are direct approximately 10% of IH will become of incarcerated and a portion of this may become strangulated. The current rates after surgical repairs are <1% of children and very adults according to the methods of hernia repairs. However, elderly patients have complex medical problems to make them unsuitable for repair. Patients with multiple medical illness and poor ASA Grades 3 and 4 are often excluded in randomized studies; objectives of this studies were looked randomized studies when comparing they case rates and different anesthetic technics, the objectives of this studies were to look at the safety of IH or older patient age 65 or more. With progresses in surgical techniques and anesthetic methods, elective IH repair surgery has become a safe outpatient procedure that

carries favorable outcomes.^[1] However, when it comes to emergency hernia repair surgery, things are different. Compared with elective surgery, post-operative mortality can increase 7-fold in emergency operations, and 20-fold if bowel resection was undertaken.^[2] With fewer pre-operative preparations and more difficult local anatomy, these patients are more likely at high risk of post-operative complication or even death.^[3,4]

MATERIALS AND METHODS

While open hernia repair may be done under general, regional (spinal), or even LA with sedation, laparoscopic hernia repair is always done under GA. If the idea of GA makes you nervous, it should not. GA is extraordinarily safe with today's precise administration and monitoring. Your anesthesiologist is present throughout your surgery and monitors you continuously. When your procedure is finished and the anesthesia is stopped, you'll wake up very quickly. And if you're concerned about side effects from GA, such as nausea and vomiting or headaches, you should know these are rare – the exception rather than the rule. Even if you're having open repair, your surgeon may prefer to perform the surgery with GA. It may be easier and more comfortable for you, too. After all, what's easier than going to sleep, waking up and it's done?

We performed a retrospective review of all inguinal repairs performed between January 2010 and December 2012 in our unit using our hospital audit module of a computerized patient information system (SARUS internet and automation system). The data were collected retrospectively by case note review and include demographics, hospital stay, ASA grade, technique of repair, and early morbidity and mortality. The patients were grouped into different ASA grades before surgery based on the comorbidity of the patient. All patients had to undergo future anesthetic assessment before surgery.

Exclusion Criteria

Ageless than 64 years, ASA Grade IV, recurrent hernia, bilateral hernia, laparoscopic repairs and LA repairs were excluded from the study. Poor patients status, obesity, bulky IH, and even systematic malignancy were not exclusion criteria. The patients were grouped according to Nyhus classification for hernia type and repair technique.

Open Hernia Repair

In this procedure, which might be done with LA and sedation or GA, the surgeon makes an incision in your groin and pushes the protruding tissue back into your abdomen. The surgeon then sews the weakened area, often reinforcing it with a synthetic mesh (hernioplasty). The opening is then closed with stitches, staples, or surgical glue.

After the surgery, you'll be encouraged to move about as soon as possible, but it might be several weeks before you're able to resume normal activities.

Laparoscopy

In this minimally invasive procedure, which requires GA, the surgeon operates through several small incisions in your abdomen. Gas is used to inflate your abdomen to make the internal organs easier to see. A small tube equipped with a tiny camera (laparoscope) is inserted into one incision. Guided by the camera, the surgeon inserts tiny instruments through other incisions to repair the hernia using synthetic mesh. People who have laparoscopic repair might have less discomfort and scarring after surgery and a quicker return to normal activities. However, hernia recurrence may be more likely with laparoscopic repair than with open surgery. Having a surgeon who is very experienced in the laparoscopic procedure may reduce this risk.

Laparoscopy allows the surgeon to avoid scar tissue from an earlier hernia repair, so it might be a good choice for people whose hernias recur after open hernia surgery. It also might be a good choice for people with hernias on both sides of the body (bilateral).

As with open surgery, it may be a few weeks before you can get back to your usual activity level.

RESULTS

The majority of the patients were male (498 [95.8%] men vs. 22 [4.2%] women). The mean age was 59.9 ± 15.7 years. Most patients ($n = 445$, 85.6%) had unilateral hernias (25.8% direct, 64.3% indirect, and 9.9% pantaloon). The overall recurrence rate was 3.8%, with a mean time to recurrence of 12.0 ± 8.6 months. Risk factors for recurrence included contaminated wounds (odds ratio [OR] 50.325; $P = 0.004$), female gender (OR 8.757; $P = 0.003$), and pantaloon hernias (OR 5.059; $P = 0.013$). Complication rates were as follows: Chronic pain syndrome (1.2%), hypoesthesia (5.2%), wound dehiscence (0.4%), infection (0.6%), hematoma/seroma (4.8%), urinary retention (1.3%), and intraoperative visceral injury (0.6%). Most procedures were open repairs (67.7%), and laparoscopic repair constituted 32.3% of all the IH repairs. Open repairs resulted in longer operating times than laparoscopic repairs (86.6 min vs. 71.6 min; $P < 0.001$), longer hospital stays (2.7 days vs. 0.7 days; $P = 0.020$), and a higher incidence of post-repair hypoesthesia (6.8% vs. 1.8%; $P = 0.018$). However, there were no significant differences in recurrence or other complications between open and laparoscopic repair.

In simple language, a total of 237 patients underwent IH repair during the study period. The median age of the

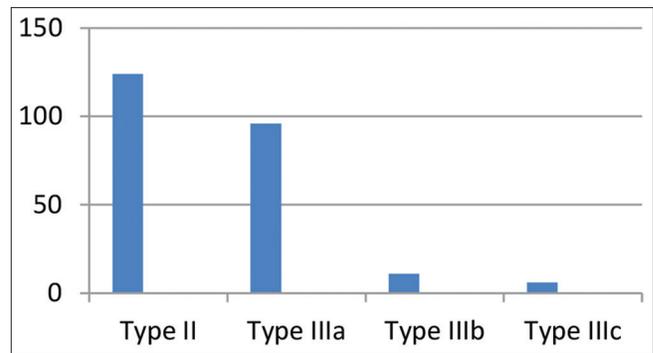
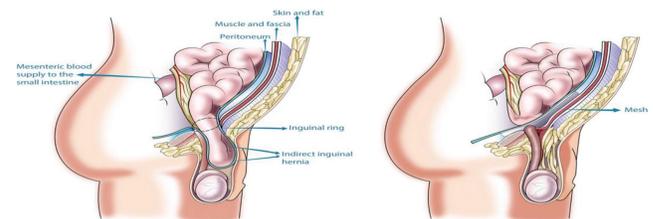


Figure 1: Nyhus classification of the patients

geriatric patients was 72 (range, 66–93). Of the study group, 153 (64.5%) patients underwent surgery under RA and 84 (35.5%) patients under GA. The majority of the patients were ASA Grades I and II (96.2%) with ASA grade patients accounting for 3.8% of all patients. According to the Nyhus classification, 124 patients were type II, 96 type III a, 11 type III b, and 6 type III c.

Treatment was 158 with mesh techniques (Lichtenstein and mesh plug) and 79 with suture technique (modified Bassini) [Figure 1]. Although most of the patients were successfully discharged next day, only 9 of them required the other day because of hematoma, seroma, and scrotal edema. Hospitalization rate was 1.07/day. There were no deaths or major complications in the group. Mean operation time was 46 min (32–105 min) in the GA.



The risk factors for IH include family history, previous contralateral hernia, male gender, age, abnormal collagen metabolism, prostatectomy, and low BMI. Perioperative risk factors for recurrence include poor surgical techniques, low surgical volumes, surgical inexperience, and LA. These should be considered when treating IH patients. IH diagnosis can be confirmed by physical examination alone in the vast majority of patients with appropriate signs and symptoms. Rarely, ultrasound is necessary. Less commonly still, a dynamic MRI or CT scan or herniography may be needed. The EHS classification system is suggested to stratify IH patients for tailored treatment, research, and audit. Symptomatic groin hernias should be treated surgically. Asymptomatic or minimally symptomatic male IH patients may be managed with “watchful waiting” since their risk of hernia-related emergencies is low. The majority of these

individuals will eventually require surgery; therefore, surgical risks and the watchful waiting strategy should be discussed with patients. Surgical treatment should be tailored to the surgeon's expertise, patient- and hernia-related characteristics, and local/national resources. Furthermore, patient health-related, lifestyle and social factors should all influence the shared decision-making process leading to hernia management. Mesh repair is recommended as first choice, either by an open procedure or a laparoendoscopic repair technique. One standard repair technique for all groin hernias does not exist. It is recommended that surgeons/surgical services provide both anterior and posterior approach options. Lichtenstein and laparoendoscopic repair are best evaluated. Many other techniques need further evaluation. Provided that resources and expertise are available, laparoendoscopic techniques have faster recovery times, lower chronic pain risk, and are cost effective. There is discussion concerning laparoendoscopic management of potential bilateral hernias (occult hernia issue). After patient consent, during transabdominal pre-peritonea (TAPP), the contralateral side should be inspected. This is not suggested during unilateral totally extraperitoneal (TEP) repair. After appropriate discussions with patients concerning results, tissue repair (first choice is the Shouldice technique) can be offered. Day surgery is recommended for the majority of groin hernia repair provided aftercare is organized. Surgeons should be aware of the intrinsic characteristics of the meshes they use. Use of so-called low-weight mesh may have slight short-term benefits such as reduced post-operative pain and shorter convalescence, but is not associated with better longer-term outcomes such as recurrence and chronic pain. Mesh selection on weight alone is not recommended. The incidence of erosion seems higher with plug versus flat mesh. It is suggested not to use plug repair techniques. The use of other implants to replace the standard flat mesh in the Lichtenstein technique is currently not recommended. In almost all cases, mesh fixation in TEP is unnecessary. In both TEP and TAPP, it is recommended to fix mesh in M3 hernias (large medial) to reduce recurrence risk. Antibiotic prophylaxis in average-risk patients in low-risk environments is not recommended in open surgery. In laparoendoscopic repair, it is never recommended. LA in open repair has many advantages, and its use is recommended provided the surgeon is experienced in this technique. GA is suggested over regional in patients aged 65 and older as it might be associated with fewer complications such as myocardial infarction, pneumonia, and thromboembolism. Perioperative field blocks and/or subfascial/subcutaneous infiltrations are recommended in all cases of open repair. Patients are recommended to resume normal activities without restrictions as soon as they feel comfortable. Provided expertise is available, it is suggested that women with groin hernias undergo laparoendoscopic repair to decrease the risk of chronic

pain and avoid missing a femoral hernia [Figure 2 and Table 1].

DISCUSSION

Our results suggest that a general hospital with high patient volume, and good training and audit practices, is able to produce excellent results following IH repair. We also found the level of patient satisfaction among those who underwent IH repair to be high. However, the incidence of IH recurrence at our center was not as low as that reported by dedicated hernia centers such as the Lichtenstein Hernia Institute and Shouldice Hospital. We propose that this difference is due to the disparity in patient volumes between our center and dedicated hernia centers. Surgeons at dedicated hernia centers typically perform in excess of 1000 IH repairs annually, and as repetition minimizes variations and errors during IH repair, higher patient volumes would give rise to the consistently low recurrence and complication rates found in the literature from these centers.

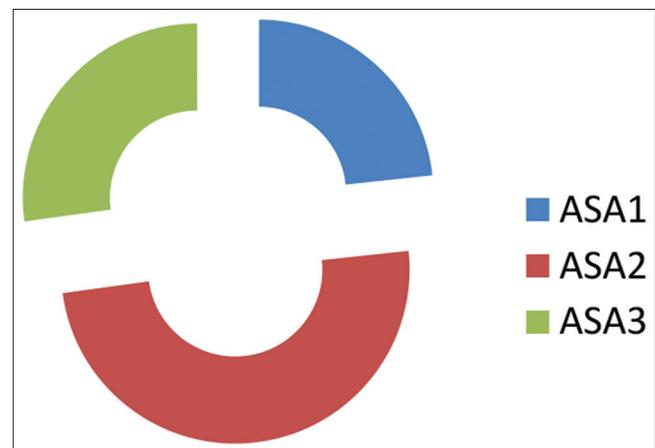


Figure 2: American Surgical Association classification of the patients

Table 1: Patients characteristics

Sex (%)	
Female	10 (4.3)
Male	227 (95.7)
Age in years median	72, 2 (range, 66–91)
Anesthesia (%)	
Regional	153 (64.6)
General	84 (35.4)
Technique (%)	
Mesh techniques	158 (66.6)
Suture technique	79 (33.4)
Mean hospital stay	1.05 (range, 1–2)
Comorbidity (%)	
Benign	98 (41.35)
Malign	9 (3.79)
Total	107 (45.14)

We are of the opinion that surgeons working in general hospitals could reorganize their services such that only designated surgeons perform IH repairs. This would help to augment these surgeons' experience. Clinical services could also be reorganized to mirror those found at dedicated hernia centers – this may include pre-operative screening for known predisposing patient factors such as chronic cough, chronic constipation, and bladder outlet obstruction. Our center has a preadmission assessment, counseling, and evaluation clinic that screens patients for medical comorbidities and provides verbal and written advice on preoperative instructions, anesthetic and surgical risk, and post-operative pain management, before surgery. Useful paraclinical services after IH repair include post-operative physiotherapy, and education on how to straighten the abdominal wall and promote avoidance of excessive weight lifting following surgical procedures. Coupled with strict protocols and teaching methodologies, the implementation of such measures may potentially push the recurrence and complication rates of general hospitals closer to that of specialized centers.

Several factors that influence the recurrence of IHS were identified in our study. These included contaminated wounds, female gender, and pantaloon hernia. However, other factors such as BMI, smoking status, urgency of the operation, grade of the surgeon, and hernia repair technique were not found to be significant. A higher recurrence rate in patients with contaminated wounds is relatively intuitive. Similarly, patients with pantaloon hernias are known to be at risk of developing recurrent hernias.^[19] Hence, the higher recurrence rate seen in patients with pantaloon hernias was not altogether surprising. However, we were unable to explain the higher recurrence rate associated with the female gender in our cohort. In a previous study, a U-shaped association between BMI and post-operative complications after hernia repair was found – patients with ideal weight showed the lowest risk, whereas patients who were either underweight or overweight/obese showed an increased risk.^[20] Although a U-shaped relationship was also observed in our study, the relationship between post-operative complications and BMI was not significant. Furthermore, other risk factors usually suspected of influencing recurrence were not found to have any association with recurrence in our study.

Contrary to the findings of our study, two other studies have reported smoking as a risk factor for IH recurrence.^[21,22] However, as compared to our study, these studies had longer follow-up periods and higher recurrence rates of 11.20%^[21] and 7.70%^[22] over 2- and 10-year periods, respectively. It is possible that the postulated effects of smoking – decreasing collagen biosynthesis and deposition, increasing proteolysis, and thereby decreasing the tensile strength of wounds – need extended study periods to determine clinical significance.

Due to our study's relatively shorter follow-up period and the possible subclinical nature of some IH recurrences among our patients, we cannot disregard the possibility that the insignificant relationship between smoking and recurrence found in our study is an underestimation of the relationship between these variables.

With respect to open and laparoscopic IH repairs in our study, we found that the seniority of surgeons was not a significant factor for hernia recurrence. This finding is in contrast to the findings of a study by Neumayer *et al.* which described inexperience in laparoscopic IH repairs to be a risk factor for recurrence.^[23] A possible explanation for our finding is that a surgeon's grade may not reflect the number of hernia repairs performed. Indeed, some surgeons at the medical officer level at our center are employed as permanent resident surgeons and do not progress along the usual track of specialist training hierarchy. It is, therefore, possible that surgeons with lower seniority may have performed more IH repairs than surgeons at the level of registrar or even consultant. On the other hand, for laparoscopic hernia repairs at our center, less-experienced surgeons are closely proctored by senior surgeons, thus accounting for the lack of difference in recurrence rates observed in our study.

For post-operative complications following hernia repair, the rates for chronic pain and numbness were included, although these two variables are not commonly reported in Asian institutions, where cultural influences may result in an underreporting of pain and numbness.^[24] In our study, hypoesthesia or numbness (5.20%) was the most common post-operative complication following hernia repair. Despite this, a majority of our patients were satisfied with the surgery and would recommend the procedure to their families and friends, indicating that hypoesthesia was not considered a major problem.

We were unable to demonstrate a difference in recurrence rates between patients who underwent laparoscopic hernia repair and those who underwent open hernia repair. This may primarily be attributed to the retrospective nature of our study. In contrast to our finding, a recent meta-analysis found TEP to be associated with a higher recurrence rate when compared to open hernia repairs.^[25] In the previous studies,^[6] intraoperative complications were found to be more frequent in patients who underwent laparoscopic IH repair when compared to open procedures. However, our sample size was too small to determine any difference between the two groups. In our study, operating time was shorter among patients who underwent laparoscopic hernia repair, even after adjusting for unilateral and bilateral hernia repair times. It is usual for laparoscopic hernia repair to take longer than its open equivalent. The disparity in our results (in spite of seniority not having a significant influence on hernia

recurrence in our study) may be accounted for by the difference in the seniority of surgeons performing these operations, as laparoscopic hernia repairs were entirely performed by surgeons at the level of associate consultant and above. We found that following hernia repair, more patients in the open hernia repair group experienced postoperative hypoesthesia than those in the laparoscopy group. However, there were no significant differences in the incidence of chronic pain or other post-operative complications in our patients, which is fairly consistent with other studies.^[6,26]

There are several advantages and disadvantages to our study. One of the strengths of our study was that data were sourced from a general hospital and not a dedicated hernia center, which many patients may not have easy access to. Our results highlight the need to improve the outcomes of IH repairs performed in general hospitals. Our findings on chronic pain and hypoesthesia among patients who underwent IH repairs are novel, as these parameters are not commonly described in Asian populations. Moreover, our review of the patients' medical records was supplemented with telephone interviews to enhance the accuracy of our results. Our results highlight that the recording of center-specific data, as well as the analysis of patient management and outcomes, is critical if surgery services at general hospitals are to progress and become more evidence based.

A key limitation of our study was the retrospective nature of the audit. While we could establish associations between certain factors, we were unable to comment on the causal relationships between them. The relatively low response rates obtained for the telephone interviews in our study may also have led to an underestimation of complications, such as chronic pain and hypoesthesia, in our cohort. However, this shortcoming is unlikely to have affected the reported incidence of recurrence or other complications in this study, as patients with complications such as seroma or infection are likely to have returned to our center for review and this would thereby have been captured in our medical records.

Our study suggests that a general hospital with strict protocols and teaching methodologies can achieve outcomes for IH repair that is comparable to those from dedicated hernia centers. It may be possible to improve the results of IH repair by realigning clinical services at general hospitals, aiming to increase the experience of individual surgeons, as well as enhancing pre- and post-operative care of patients with IH.

CONCLUSION

Despite being economically favorable and equivalent to other surgical techniques in terms of recurrence

and post-operative pain, open repair under LA is still a vastly underused method of treating inguinal and abdominal wall hernia. With the ever-increasing age of the population, there will inevitably be many more patients who cannot safely have general anesthetic due to their comorbidities and thus require an intervention which excludes such a risk. The current pressure for training surgeons to become proficient in laparoscopic techniques risks the loss of the skill and competency in undertaking this kind of repair and thus in future many of these patients may not be able to have definitive repair, thus exposing them to the risks that lie therein. With increasing emphasis of teaching/learning laparoscopic skills due to advances of the last decade or so, the art of basic surgical skills is becoming clouded by the era of so-called "keyhole surgery," the minimally invasive surgery, and robotic surgery due to increasing patient demand and surgeon's preference because of the added excitement of the surgical skills. Unfortunately, with the aging population and the increasing number and severity of comorbidities, a significantly high proportion of these patients are likely to be refused surgery due to the risks associated with the GA needed to undertake these new advances in keyhole surgery. We have shown that LA hernia repair is superior to GA in terms of cost-effectiveness, patient complications, and satisfaction and thus by extension preferable to laparoscopic repair in certain situations, that is, in those patients who are unable to tolerate a GA due to age and significant comorbidities.

To be well equipped to serve the aging population of tomorrow, we propose that training surgeons of today and future should be expected to do a mandatory number of hernia repairs under LA, in addition to being exposed to laparoscopic skills. We also consider initiatives such as WIWO hernia services to show many benefits for both health-care organizations and the patients and should be implemented in other hospital trusts to allow for a more cost-effective NHS.

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