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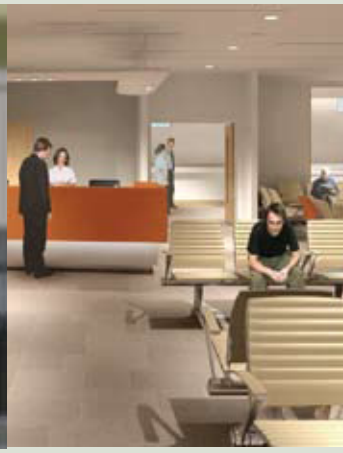

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Editorial

Doug McWhinnie

It's summer and it is the holiday season for many of us. As excellent holiday reading, we have three very different articles to peruse at leisure!

Ever since Henrik Kehlet published a multimodal approach to patient recovery following colorectal surgery in the 1990's, there has been a plethora of papers worldwide analysing the benefits of this approach of enhanced recovery. The concept has been applied across other subspecialties including orthopaedics and gynaecology, again with considerable success. In this issue of the journal, we have a paper from an orthopaedic group working in a district hospital in England, sharing their experiences in shortening the length of stay for lower limb arthroplasty and demonstating how they focussed on each component of the patient pathway.

From Athens comes an audit of day case breast surgery, examining the outcomes of 173 consecutive patients with invasive breast cancer treated in the day surgery unit. Only one patient required an overnight stay and even then, this was due to a cardiac arrhythmia. As ever, patients were sent home with drains in-situ to be removed several days later. This audit confirms that day surgery for most breast procedures is now becoming mainstream, but remember just how long it has taken day case laparoscopic cholecystectomy to be accepted as the norm!

Our third paper is a review article from Stockholm concerning the fine tuning of depth of anaesthesia to improve post-operative delirium and cognitive dysfunction , especially in the elderly. Jan Jacobsen concludes that titration of anaesthetic delivery by the use of an EEG-based depth-of-anaesthesia monitor may improve the management of the elderly at risk for cognitive side effects but other factors such as the choice of main anaesthetic and anaesthetic technique are also important and may need further study.

Finally, while you are enjoying some well-earned time off, put your thoughts together and write an article for the journal on your return! Remember, we rely on our members for journal contributions so please furnish us with articles, case reports or anecdotal comments.

I look forward to your contributions!

Doug McWhinnie
Editor

The Enhanced Recovery Programme in Hip and Knee Arthroplasty: A Review Article

S.M. Ng Man Sun, M.E.A. Bailey, O.J. Pearce

Abstract

Enhanced Recovery Programmes were first developed in Copenhagen by Professor Henrik Kehlet in the 1990s1. In hip and knee arthroplasty, especially knee, there is a lot that can be achieved in terms of length of stay and pain relief improvement when compared to standard care.

By focusing on the entire patient journey from GP referral to hospital inpatient stay in a critical manner, drawing on a large body of work nationally as well as internationally, the patient experience can be 'enhanced'.

Keywords: Hip and Knee Arthroplasty, Enhanced Recovery Programme.

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Introduction

The concept of an enhanced recovery programme (ERP) was first introduced in colorectal surgery with focus on a multi-modal approach to reducing peri-operative morbidity and accelerating rehabilitation [2]. The use of these principles has helped to improve patient experience and safely reduce length of stay in hospital across a number of surgical specialities. Economic benefits have also been highlighted in studies of enhanced recovery in lower limb arthroplasty [3]. This may be achieved through re-organisation of existing hospital services around a more patient focussed approach. Interestingly, each enhanced recovery programme is not a specific entity, rather a method that can be applied across different specialities and institutions. Applying an enhanced recovery programme to lower limb arthroplasty starts from GP referral, through outpatient pre-operative management, and finally hospital admission and discharge. This article outlines an example of an enhanced recovery programme developed and applied to hip and knee arthroplasty in an NHS district general hospital.

The ERP at Milton Keynes Hospital

A new ERP was introduced in 2010 to improve patient outcomes following hip and knee arthroplasty as well as ensuring a patient centred approach was delivered.

In order to improve patient outcomes and speed up recovery, each aspect of the patient pathway must be analysed and optimised [4]. This begins at the pre-operative phase in the outpatient department, progresses through intra-operative and post-operative care, and finally to discharge of patients home. In order to improve each step in turn, regular meetings involving the main participants of the multi-disciplinary team are vital. Through examining the process, duplications of work can be identified and removed, weaknesses strengthened and discussions had about the possibility of change in practice if required. The key members involved in the care of lower limb arthroplasty patients include:

- Orthopaedic surgeon
- Anaesthetist
- Matron for Surgical Services
- Pre-assessment senior nurse
- Ward senior Nurse
- Senior Pharmacist
- Pain Specialist Nurse
- Senior physiotherapist
- Senior Occupational Therapist

By having the relevant people at the initial (and subsequent) meeting(s), positive suggestions may be brought forward and progress made to develop an enhanced recovery programme. Identifiable attributes of the personnel attending the initial meetings are their experience and enthusiasm to help improve patient experience. Inevitably, changes will be required to aspects of the existing infrastructure, and having the appropriate members of the multi-disciplinary team to achieve this is vital. When developing an enhanced recovery program, the combination of a highly structured and standardised approach with multidisciplinary team involvement will certainly lead to improved patient care.

Pre-operative

The ERP really starts at GP referral and the first outpatient appointment with the orthopaedic team. Once a decision has been made that all non-operative interventions have been exhausted, and the patient would benefit from a hip or knee replacement, they are listed for surgery. At the same visit, a mini pre-assessment (termed 'health screening') is undertaken including: a health questionnaire, Body Mass Index (BMI), Heart Rate (HR) and Blood Pressure (BP) measurements. By doing so at an early stage, high-risk patients who may need an anaesthetic review are identified early. This process also identifies common problems such as poorly controlled blood pressure, diabetes, or sleep apnoea that may require further optimisation before the patient is put on the list. This saves the problem of late identification and cancellation either on the day or at the time of the formal pre-assessment which is frequently in the 2–3 week run up to the date of surgery. Formal pre-assessment, closer to the date of surgery, includes standardised pre-operative tests.

Patient Education

Patient education and managing each individual's expectation is fundamental to the success of ERP. The provision of standardised information such as leaflets at pre-assessment and learning experiences at 'joint school' can help reduce patient anxiety and manage expectation [5] , particularly with regards to length of stay in

hospital and the rehabilitation programme. Joint school is scheduled as a morning or afternoon session run separately for hip and knee patients (in our institution, one Tuesday afternoon is for hips, and the following Tuesday is for knees). It is led by physiotherapists, occupational therapists and also attended by a pain specialist nurse. Each therapist in turn demonstrates what the patient can expect during his or her inpatient stay. In the case of physiotherapy, patients are educated on the progression of mobilisation from frame to crutches, followed by a stairs assessment before discharge when independent. They also demonstrate pre-operative quadriceps strengthening exercises, which have been shown to speed up and ease recovery and have the impact of reducing length of stay [6]. Occupational therapists discuss seat raises, hip precautions, and any modifications required on individual basis. The pain control specialist nurse talks through the different painkillers used during the inpatient stay and on discharge home, as well as what to expect from a pain point of view during their post operative period.

Inpatient Admission

The majority of patients are admitted on the day of surgery to a designated admissions ward. Patients observe standardised fasting regimes with no food 6 hours prior to surgery but clear fluids allowed up to 2 hours prior to surgery. Pre-operative booklets including theatre che ck lists are completed on the day of surgery and patients visited by the operating surgeon and anaesthetists.

Patients are given premedication with a Fentanyl patch prior to surgery, so that the bioavailable dose increases to a treatment level in the postoperative period when it is needed most [7]. This replaces PCA (patient controlled analgesia) pumps which, in an internal audit, were found to be responsible for a significant incidence of nausea, vomiting and/or postural hypotension, which had the knock on effect of delaying rehabilitation and increasing length of stay. This also replaces oral opiates, an alternative to PCA, which rely upon already busy nurses to administer them on the ward in a timely and pre-emptive manner.

Anaesthetic Room

IV antibiotics are administered at induction as per trust protocol. Patients undergo either spinal anaesthesia, general anaesthesia, or a combination of the two. Other pre-medication includes dexamethasone, which has pain modulation, antiemetic, and mood enhancing properties. Cyclizine is used for its antiemetic properties, and Tranexamic acid is used to reduce intra operative blood loss, hence reducing the post operative morbidity associated with anaemia and reducing transfusion rates [8].

Intra-Operative

Surgical technique is not standardised but all other processes within the theatre are. A tourniquet is used for all knee replacements with care taken to reduce bleeding.

Optimisation of Theatre Environment

In order to enhance pain relief, peri-articular injection of local anaesthetic is performed with volume based on weight. Ropivacaine (0.2% 200ml bags) is the drug of choice due to a lower cardiac side effect profile than it's cheaper alternative Bupivacaine. Large volume dilute anaesthetics seemed to be the most important factor determining effectiveness [9]. For knee replacements, this is injected into the posterior capsule, the medial and lateral gutters, the medial and lateral femoral periosteal tissue, the quads and patellar tendons, the medial tibial released tissue, and the subcutaneous skin and fat.

For hip replacements, injection is performed into the anterior and posterior capsule, the vastus lateralis, the short external rotators, the gluteus maximus fibres involved in the trans fascia lata incision, and the subcutaneous skin and fat.

Pain Relief Regimen

A standardised analgesia regimen was formulated and is prescribed to all patients unless contraindicated (Table 1). This avoids the use of patient controlled analgesia (PCA), which is associated with the side effects of nausea, vomiting and postural hypotension as well as limiting mobilisation. In place of a PCA, a Fentanyl patch 12 mcg for 72 hours is applied prior to surgery. Intravenous Paracetamol is also preferred given its opiate sparing properties in the first 24 hours post-operative period.

Details of Regimen

Table 1 Post-operative analgesia regimen.

Drug	Dose
Paracetamol	1g IV for first 48hrs followed by PO
Ibuprofen	400mg if <70yrs old, 200mg if <70yrs
Fentanyl patch	12mcg, for 72 hours
Oxynorm (for breakthrough pain)	5mg PRN 4–6hrly
Cyclizine	50mg PRN three times daily
Dexamethasone (antiemetic, mood enhancing and pain modulation)	10mg PO on induction
Gabapentin (pain modulation)	600mg PO on induction
Ranitidine (antacid and antiemetic)	150mg PO on induction

Rehabilitation

Physiotherapy plays an important role in the enhanced recovery pathway [10]. Drains are removed 12 hours after surgery to allow easier and early mobilisation. A dedicated physiotherapy team, working 7 days a week (termed 5+2, at weekends, as a non on-call physiotherapist sees all joint replacement patients and mobilises them as they would a normal weekday), review post-operative joint arthroplasty patients on a daily basis. Physiotherapy treatment focuses on early mobilisation and range of motion. Muscle strengthening exercises are also performed. Knee arthroplasty patients also have continuous passive movement (CPM) machines the night after surgery.

Discharge

Patients are discharged home once their predefined goals have been achieved as outlined above. Arrangements for extra support are made prior to admission if they are required. Standardised discharge medication, including a medium strength painkiller, is prescribed to ensure the patient continues to mobilise and improve their range of motion. Physiotherapy is performed at the operating hospital or performed at home by physiotherapists from the hospital to ensure continuity of care within the Enhanced Recovery Team.

Thromboprophylaxis

All patients are prescribed Pradaxa for 14 days post total knee replacement and 28 days post total hip replacement as per the NICE guidelines.

Follow Up Proms (Patient Reported Outcome Measures) Clinics

All patients are initially followed up by the operating surgeon at the 6 week mark. Thereafter, in our institution, they are followed up at 3 months, 6 months, and 12 months by an extended scope research physiotherapist who performs Oxford Hip and Knee scores as well as a 10m timed walk and a Visual Analogue Score (VAS) for pain. These are compared with the scores measured on the day of surgery pre-operatively. This complies with the national directive to collect PROMS on all patients undergoing elective surgery.

What does the Future Hold?

A new local anaesthetic, Exparel, has been designed with a delayed release system of liposomes surrounding standard bupivacaine. It lasts between 48 and 72 hours when injected peri-articularly, and has obvious benefits in terms of reducing pain and analgesic requirement post operatively [11]. Currently it is only available in the USA as the single company that manufactures does not have the capacity to supply the worldwide market yet.

Further Improvements

In order to allow for continuous improvement of the ERP, regular audits are performed, in particular focusing on pain and efficacy of the prescribed regimen. Feedback meetings with senior members of the multi-disciplinary team are also vital to keep the program moving forward. The continued enthusiasm by a lead surgeon has been key to driving the programme forward and should not be underestimated.

Summary

Enhanced recovery programmes across a wide variety of specialities have all led to improvements in patient experience. In orthopaedics it is mainly applied to joint arthroplasty. Having a large group of senior members of the multidisciplinary team, and an enthusiasm to drive continued improvement has led to a successful implementation of the ERP at Milton Keynes.

Overall, when each step in the patient journey has been scrutinised, one finds savings in terms of length of stay, reduction in cancellations on the day (or during the waiting list time), and perhaps most importantly, that the patients have a more pain free and pleasant post operative period as well as recovery at home.

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Fine tuning depth of anaesthesia: important impact on quality of care or merely waste of cost associated to EEG-electrodes

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Day surgery is becoming increasingly popular and more and more patients and surgical procedures are nowadays managed as day cases. Enhanced recovery and early discharge has a number of beneficial effects. Shortening hospital stay reduces most certainly the risk for nosocomial infections. Early ambulation and alimentation has without doubt beneficial effects on the homeostasis and reduces the risk for thromboembolic complications. But are all patients suitable for day surgery? Some may argue that the elderly may have a problem with early discharge and the demand for self-care already short after end of surgery and anaesthesia. Surgery and anaesthesia exert comparatively greater adverse effects on the elderly than on the younger brain, manifest by the higher prevalence of postoperative delirium and cognitive dysfunction. Strom et al [1] recently raised the question; *Should general anaesthesia be avoided in the elderly?* Efforts should without doubt be put on optimising the perioperative care of the elderly patient.

The enhanced recovery logistics has also been shown to reduce the risk for cognitive side effects [2]. The combination of a fast-track set-up with multimodal opioid-sparing analgesia has been shown by the Kehlet group in Copenhagen [3] to eliminate the occurrence of delirium after elective arthroplasty in elderly patients. They suggest that fast-track methodology may reduce the incidence of postoperative cognitive decline after surgery [4]. Whether day surgery per see protect the elderly from deterioration in cognitive performance as compared in hospital care has been suggested in one of the studies by the ISPOC group [5]. It seems obvious that effort should be made to avoid prolonged hospital stay in the elderly at risk patient for postoperative cognitive side effects; postoperative delirium (PD) and postoperative cognitive dysfunction (POCD).

The use of EEG-based depth-of-anaesthesia monitors in order to titrate anaesthetic depth, administration of anaesthetic has been shown to improve, facilitate emergence. Wong et al [6] showed already in 2002 that titration of isoflurane using the BIS index decreased utilization of isoflurane and contributed to faster emergence of elderly patients undergoing elective knee or hip replacement surgery. White et al [7] showed that compared with standard anaesthesia monitoring practice, adjunctive use of auditory evoked potential and BIS monitoring can improve titration of desflurane during general anaesthesia, leading to an improved recovery profile after ambulatory surgery. Liu [8] conducted a meta-analysis about the use of EEG bi-spectral index during ambulatory surgery in 2004 and concluded that the use of BIS monitoring modestly reduced anaesthetic consumption, risk of nausea and vomiting, and recovery room time. The beneficial effects from the use of EEG-based depth of anaesthesia monitoring on early recovery and anaesthetic consumption has also been supported in the meta-analysis by Punjasawadwong et al [9] published in 2007 and the systematic review by Shepherd et al [10] published in 2013.

There is a strengthened interest for the use of EEG-based depth-of-anaesthesia monitors for titration of anaesthesia delivery in its possibility to reduce the risk for neurocognitive side effects such as delirium and cognitive dysfunction in at risk patients. Radtke et al [11] from Berlin published in 2013 a study showing that intraoperative neuro-monitoring was associated with a lower incidence of delirium, possibly by reducing extreme low BIS values. They suggest that in high-risk surgical patients e.g. the elderly, this may give the anaesthesiologist a possibility to influence one precipitating factor in the complex genesis of delirium. Jildenstål et al showed that AEP monitoring allows dose reduction of anaesthetic agents, leading to better cardiovascular stability and decreased requirements for intra-operative fluids and vasopressors. They also found a lower number of patients with cognitive decline at 24-hours [12] and that IL-6 increase [13] was less pronounced in the AEP titrated group of patients following minor ophthalmic surgery. There is also a recent study although in major surgery still suggesting obvious clinically important benefits associated to EEG-based titration of anaesthesia delivery in the elderly. Chan et al we tested in a randomized controlled trial, the effect of BIS monitoring on POCD in 921 elderly patients undergoing major non cardiac surgery. Patients were randomly assigned to receive either BIS-guided anaesthesia or routine care. The BIS group had anaesthesia adjusted to maintain a BIS value between 40 and 60 during maintenance of anaesthesia. Routine care group had BIS measured but not revealed to attending anaesthesiologists. Anaesthesia was adjusted according to traditional clinical signs and hemodynamic parameters. A neuropsychology battery of tests was administered before and at 1 week and 3 months after surgery. Results were compared with matched control patients who did not have surgery during the same period. Delirium was measured using the confusion assessment method criteria. The median (interquartile range) BIS values during the maintenance period of anaesthesia were significantly lower in the control group, 36 (31 to 49), compared with the BIS-guided group, 53 (48 to 57), $P<0.001$. BIS-guided anaesthesia reduced the drug consumption similar to previous studies; the propofol delivery by 21% and that for volatile anaesthetics by 30%. There were fewer patients with delirium in the BIS group compared with routine care (15.6% vs. 24.1%, $P=0.01$). Although cognitive performance was similar between groups at 1 week after surgery, patients in the BIS group had a lower rate of POCD at 3 months compared with routine care (10.2% vs. 14.7%; adjusted odds ratio 0.67; 95% confidence interval, 0.32-0.98; $P=0.025$). Whether the choice of main anaesthetic has any

clinical significant impact on the risk for cognitive side effects is still not adequately studied. We do await the results from the Italian PINOCChIO [14] study. The potential organ protecting properties of halogenated inhaled anaesthetics needs further studies [15,16]. There is also a most recent Cochrane meta-analysis around the regional anaesthesia and outcome [17]. The results are hard to interpolate for the day surgery practice, the authors merely conclude; *Compared with general anaesthesia, a central neuraxial block may reduce the zero to 30-day mortality for patients undergoing surgery with intermediate to high cardiac risk (level of evidence, moderate). Further research is required.*

It seems reasonable to conclude that day surgery, shortening the hospital stay, is reasonably of value for the elderly patients requiring surgery. Titration of anaesthetic delivery by the use of an EEG-based depth-of-anaesthesia monitor seems to have the potential to further improve the management of the elderly at risk for cognitive side effect patient. The choice of main anaesthetic and anaesthetic technique needs further studies. The elderly most however have adequate support and supervision; escort during transfer back home and adequate support during first postoperative days while in the home environment.

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Day Surgery for Breast Cancer: A series from Greece and literature review

IE Katsoulis, A Ioakeimidis, I Misitzis, E Filopoulos

Abstract

Introduction: Ambulatory definitive breast cancer surgery has been evolving over the last two decades. The experience of treating such patients in a dedicated day case surgical unit is presented here.

Method: The records of 173 consecutive patients with invasive breast cancer, who received definitive surgical treatment in the Day Surgery Unit (DSU) of our Institution, were retrospectively reviewed.

Results: The mean age of patients was 51.5 years (range 30 – 76). Only one of them stayed in hospital overnight due to postoperative cardiac arrhythmia. All the patients who underwent either a mastectomy or an axillary clearance were discharged with their drains which were removed in the outpatient clinic at a mean time of 5 days (range 1-8). There were no readmissions. Likewise, the wound complications which ensued in 16 patients were successfully treated in the outpatient clinic. In cases of axillary clearance the mean number of the harvested lymph nodes was 15 (range 10-28).

Conclusion: Day surgery for breast cancer, is safe and effective in appropriately selected patients.

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Introduction

Ambulatory surgery for breast cancer is not a new concept. Since the beginning of the 1990's several studies have highlighted the advantages of outpatient definitive breast cancer surgery [1,2,3,4,5]. In the United States, the proportions of patients with breast cancer receiving day surgery, increased from 3.2% to 19.4% for mastectomy and from 48.9% to 77.8% for breast conserving surgery from 1993 to 2002 [6]. This practice has been shown to be safe and effective with equivalent complication rates and high psychological satisfaction when compared to in-patient hospital care [7,8,9,10,11,12,13]. Our experience of treating such patients in a dedicated day case surgical unit is presented here.

Methods

Patients with invasive breast cancer, who received definitive surgical treatment in the Day Surgery Unit (DSU) of our Institution, were retrospectively reviewed. Only patients who were treated in the DSU following a preoperative diagnosis of breast cancer were included in the study. The demographics, the criteria for selection of a patient to be managed as a day case, the type of surgery and anaesthesia were recorded. The full spectrum of operative procedures for invasive breast cancer was performed. Axillary sentinel lymph node biopsy (SLNB) was performed using either blue dye technique or filtered technetium-labeled sulfur colloid (Tc^{99} scintigraphy). On several occasions, the combination of both mapping techniques was used to increase the accuracy of the identification of the sentinel node. In cases where insertion of drains was considered necessary, e.g. mastectomies and axillary procedures, the patient was discharged with the drain and reviewed as an outpatient two days later. The prerequisite for performing surgery on breast cancer patients was the preoperative assessment of their physical, mental, psychological and social suitability. The vast majority of patients were operated under general anaesthesia. Infiltration of the brachial plexus and the intercostal nerves with ropivacaine was applied following mastectomy and/or axillary dissection. The complications and their management, cancelations of discharge and readmissions, were noted.

Results

The records of 173 consecutive patients with a mean age of 51.5 years (range 30–76) were reviewed. The operative procedures are presented in Table 1. Only one patient stayed in hospital overnight due to postoperative cardiac arrhythmia following breast wide local excision and sentinel lymph node dissection. All patients who underwent mastectomy or axillary clearance were discharged with their drains. The drains were removed in the outpatient clinic at a mean time of 5 days (range 1–8). There were no readmissions. Likewise, the wound complications which ensued in 16 patients were successfully treated in the outpatient clinic. In cases of axillary clearance the mean number of the harvested lymph nodes was 15 (range 10–28).

Table 1 Operative procedures of the present study.

Local excision and SLNB	72
Local excision and axillary clearance	49
Mastectomy and SLNB	17
Modified radical mastectomy	35
Total	**173**

Discussion

The performance of breast cancer surgery as an outpatient procedure is an evolving surgical practice. Initially, the indication was minimal procedures such as simple lumpectomy and breast conserving surgery (BCS). However, it has been shown that the full range of surgery for breast cancer can be safely performed on an outpatient basis, providing that patient's physical, mental, psychological and social suitability have been assessed. [7–15]

The facility of a dedicated DSU enables and encourages surgeons to practice outpatient surgery for breast cancer. The DSU of our Institution was established in 2006 having adopted all the guidelines and international standards for ambulatory surgery. Recently, the Unit has been ISO 9000 certified. To the best of our knowledge, this is the

first study in Greece to evaluate the safety and efficacy of ambulatory surgery for breast cancer.

The performance of axillary procedures has been reported to be an independent factor for prolongation of hospital stay. Nevertheless, in the DSU setting the patients can be discharged home with the axillary drain and be reviewed on an outpatient basis. Athey N et al. suggested that axillary drains can be avoided and reported a series of day case breast cancer axillary surgery without drains. However, they also reported 22% symptomatic post-operative seromas and 10% of patients with wound infections .

Margolese and Lasry [9], compared an outpatient group and an inpatient group with similar characteristics, both of which underwent routine axillary lymph node dissection, combined with breast surgery for most of them. Discharge of patients on the same day was found to be possible while the drains were still in place, without significant consequences. Both groups were interviewed and reported similar levels of pain, fear, anxiety, health assessment, and quality of life. Outpatients had a significantly better emotional adjustment and fewer psychological distress symptoms. Inpatients reported that it took an average of 27 days to feel that they had recovered from surgery, about 10 days longer than outpatients. Inpatients' return to usual activities was also about 11 days later.

The type of anaesthesia is an important consideration for the efficacy of ambulatory breast surgery. The performance of thoracic paravertebral block instead of general anaesthesia seems to be associated with less postoperative pain, less postoperative nausea and vomiting, favouring early discharge from hospital. In our series, the majority of patients were operated under general anaesthesia. Intercostal block with ropivacaine was applied following mastectomy and/or axillary dissection.

An increase in day case mastectomy may result in lower rates of postmastectomy reconstruction. Mastectomy with immediate breast reconstruction, as it involves more extended surgical dissection, is more prone to complications and most surgeons would not perform it on a day case basis.

An argument exists that some complications could be diagnosed and managed earlier in hospitalized patients. However, most delayed complications are minor and can timely treated if written information is given to the patients along with easy access to hospital after discharge.

The psychological advantages of the same day discharge after breast cancer surgery have been highlighted. Recovery from surgery is faster and the patient tends to play down the seriousness of the operation and to have a better mental attitude to neoplastic disease. Moreover, when performing BCS with SLNB in day surgery, fewer than 50% of breast cancer patients require another surgical treatment, completing the surgery in a single session. [14]

Marla and Stalard [13] in their systematic review of day surgery for breast cancer included only observational studies since no randomised controlled trials had been published at the time of their review. The rate of discharge after day surgery was universally high with very low acute readmission rates. PONV, patient anxiety and pain control were the main reasons for failed discharge. Patient satisfaction with day surgery was high and psychological recovery was faster. Finally, the hospital costs were lower for day surgery. The authors suggested that further trials with validated questionnaires are required to confirm patient satisfaction and psychological well-being. Tables 2 (below) and 3 (overleaf) summarize the failures of discharge and readmission rates in various series of ambulatory surgery for breast cancer including our present study. Our results are comparable and we believe reflect the meticulous application of patients' selection criteria as well as the excellent team work in our DSU.

The financial benefits of omitting unnecessary hospital stay are apparent especially nowadays that health care costs are under review worldwide. Ambulatory surgery in dedicated DSUs can reduce waiting lists and limit costs. These benefits are important particularly in a country like Greece with its severe economic crisis. Adopting such a program can lead to significant savings without compromising the quality of care. [5]

As the popularity of outpatient breast cancer surgery continues to grow, more evidence-based analyses related to quality and outcomes of day surgery for breast cancer among various populations are needed.[6]

In conclusion, day surgery for breast cancer, is safe and effective in appropriately selected patients.

Table 2 Number of patients and reasons of discharge failure in various series of ambulatory surgery for breast cancer

Study	n	Discharge failure (%)	Vomiting/ Nausea	Anxiety/ Patient's choice	Pain	Wound complications	Medical complications	Overrunning theatre lists
Goodman et al[1]	223	0	-	-	-	-	-	-
McManus et al[2]	118	3 (2.5)	1	-	-	1	1	-
Seltzer et al[3]	133	0	-	-	-	-	-	-
Dooley et al[7]	92	1 (1.1)	-	1	-	-	-	-
Dravet et al[8]	418	52 (12.4)	19	11	5	11	3	3
Friedman et al[10]	181	2 (1.1)	-	2	-	-	-	-
Athey et al[17]	165	16 (1)	2	-		1	2	11
Marchal et al[11]	274	38 (13.8)	16	14	6	2	-	-
Carcano et al[12]	32	0	-	-	-	-	-	-
Marrazzo et al[14]	100	4 (4)	-	4	-	-	-	-
Present study	173	1 (0.6)	-	-	-	-	1	-

Table 3 Readmission rates in various series of ambulatory surgery for breast cancer. .

Study	Readmissions (%)
Goodman et al[1]	0
Dooley et al[7]	0
Dravet et al[8]	25 (7%)
Friedman et al[10]	0
Athey et al[17]	0
Marchal et al[11]	0
Carcano et al[12]	3 (8%)
Marrazzo et al[14]	0
Present study	0

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