Can we extend the 75%-day case target to emergency surgery? Evaluation of ambulatory emergency pathways

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Abstract

Introduction: Elective day surgery rates have increased dramatically over recent years with more patients with complex medical and social needs being considered appropriate for day surgery and many more challenging procedures entering the day surgery arena. Whilst some minor emergency procedures such as abscess drainage and surgical management of miscarriage have been managed via day case pathways in some trusts for a number of years. Many trusts still have no established day case pathway for these procedures and day case rates are by no means universally high across the country. In addition, management of more complex emergency procedures such as laparoscopic cholecystectomy, appendicectomy and ureteric stone surgery routinely as day surgery is not routine in most UK trusts. We describe the introduction of new ambulatory pathways for more complex surgical procedures which have been developed following the success of our minor day case emergency pathways.

Methods: Four ambulatory pathways successfully function at our hospital. Well-established discharge processes give surgical teams confidence to broaden the scope of surgery undertaken as day case. A novel planned ambulatory emergency pathway allows any appropriate acute surgical patient to be discharged home and return to the Day Surgery Unit (DSU) when there is a dedicated day case emergency list. It encourages emergency patients to be transferred from inpatient wards to DSU for surgery and subsequent same day discharge. This has enabled more complex emergency surgical procedures such as laparoscopic cholecystectomy and appendicectomy to be introduced to the day surgery arena. 12 years outcome data in terms of day case rates, rates of unplanned admissions and post-operative symptoms and satisfaction were obtained from our electronic patient record system. These were analysed retrospectively.

Results: Established emergency ambulatory pathways: In 12 years, 1831 patients underwent drainage of abscess and 1017 (56%) had a length of stay of 0 days (LOS=0), while 1540 women required Surgical Management of Miscarriage (SMOM) and 1102 (72%) had LOS=0.

New Ambulatory Pathways: Over 22 months (April 2017 to January 2019), 442 patients (18 children, 424 adults) underwent emergency surgery via a novel ambulatory pathway. This freed 385 hours 52 minutes of emergency theatre time and saved 671 bed days with estimated cost of £268,400. In addition, inpatients were identified as appropriate for day case and streamlined to DSU following surgery, with 75% successfully discharged. Since the pathway's introduction, emergency laparoscopic cholecystectomy day case rates have increased from 0 to 30%.

Conclusion: Robust ambulatory emergency pathways for appropriately selected cases can improve patient flow and experience while saving emergency theatre time and reducing bed occupancy. Ambulatory emergency surgery should be considered at any stage of a patient's journey. Pathways can serve different patient groups with a common goal. Ideally admission is avoided altogether, but appropriately selected inpatients are streamlined to save post-operative stays.

Introduction

Increasing demand continues to put enormous pressure on NHS trusts. In the UK, the number of hospital admissions increased by 0.5% in the last year and is 23.5% higher than 10 years ago (1). A significant proportion of acute surgical patients occupy hospital beds while awaiting minor or intermediate emergency procedures, which are often delayed by major procedures rightfully taking priority. The result is increased bed occupancy, unnecessary prolonged fasting and patient dissatisfaction. Combined with unforeseen cancellations or under-booked elective lists, this caused frustration among our workforce who felt they could be delivering better care.

Elective ambulatory surgery continues to evolve and be offered for increasingly complex procedures. Over the last decade it has become clear that the same processes can serve to deliver safe ambulatory emergency surgery. The IAAS defines ambulatory emergency surgery as the management of an emergency patient according to an ambulatory surgical pathway, avoiding overnight stay following their surgical procedure. The authors also aim to avoid pre-operative stays. Patients requiring surgical management of miscarriage or incision and drainage of an abscess are often well enough to be discharged home with a safety net, while awaiting definitive management. Many trusts will already have functioning pathways for these procedures which may be a foundation for developing an extended emergency ambulatory service. However benchmarked data from NHS England (Model Hospital), shows that a large number of trusts do not achieve high day case rates for even these routine emergency procedures let alone more complex surgery. At Torbay Hospital an abscess pathway has been used for 15 years and has transformed the care of these patients, with mean length of stay reduced by 28 h 20mins (2). Moreover, it optimised the use of NCEPOD theatre time, by increasing operating during the first hour in the morning. The authors describe the transformation of emergency surgical services by learning from these established pathways and using expertise to develop day case pathways for more complex emergency surgery

In 2013, the Royal United Hospital in Bath piloted an Emergency Surgery Ambulatory clinic and found that 71% of acute patients seen by a consultant surgeon could be diagnosed and discharged on the same day with a planned operating date. By 2016, 82% of these patients were discharged on the same day and 85-90 bed stays were saved every month. Freed up theatre capacity meant that pre-operative stays reduced, and laparotomies went to theatre sooner (3). BADS 2019 guidelines (4) issued a table of emergency procedures suitable for day surgery (Table 1) which includes laparoscopic cholecystectomy and appendicectomy. Initiatives such as Chole-QuIC have been successful in reducing the time to surgery for patients requiring emergency laparoscopic cholecystectomy (5). However very few hospitals are managing these cases on a day case basis. (NHS England Model Hospital Data). In 2017, key opinion leaders of day surgery at Torbay hospital were inspired to expand its ambulatory emergency service in a cost neutral fashion. This report aims to describe the pathways in use at Torbay hospital with supporting outcome data. The purpose of the work is to emphasise the possibility of making day surgery the routine standard of care for the majority of emergency surgery.

Methods

Ambulatory Emergency Pathways

Torbay Hospital is a district general hospital in Devon with a successful standalone Day Surgery Unit (DSU). The DSU performs above the national standard in terms of day case rates for many elective procedures and has pioneered a number of challenging procedures on a day case basis. Its success is driven by a highly trained and motivated multidisciplinary team who follow robust admission and discharge processes. This includes electronically generated take home prescriptions and standardised routine telephone follow up to all patients on the day after their discharge, which enables robust audit of patient outcomes.

Emergency ambulatory surgery occurs via a number of different pathways. Here, we describe four functioning pathways at Torbay Hospital, starting with the earliest. We retrospectively reviewed patient records and identified patients with a length of stay of 0 days (LOS = 0) as well as those discharged on the same day as their surgery (who may have had a LOS>0 due to preoperative admission). Data was obtained from the hospital electronic patient record (Galaxy Surgery © CSC) which provides detail of every patient undergoing surgery in the trust. For patients who are managed via a day case pathway, it includes whether they were admitted or discharged, reason for unplanned admission and outcome data obtained from a routine telephone call the day after surgery. All data is entered contemporaneously by the clinical staff and is used to drive continuous service improvement and evaluation of the services provided.

Abscess pathway

This pathway has been used since 2005. Patients presenting to the emergency department (ED) or ambulatory medical unit (AMU) via their GP are evaluated by the on call surgical team. If they require incision and drainage and the patient is medically and socially suitable for ambulatory surgery, they can be discharged home with advice to return to DSU the following morning. From there, they are readied for theatre by day surgery staff and either sent for by the main emergency theatre or operated on in a dedicated day surgery emergency list. These cases often serve as the 'golden patient' and maximise use of the first hour of operating in the morning. If operated on in the main theatre complex, they return to the DSU after primary recovery for discharge via the day case pathway.

A retrospective search of the hospital theatre IT system found all cases of 'incision and drainage of skin abscess' since March 2008. Length of stay, type of anaesthetic and telephone follow up data were reviewed.

Surgical management of miscarriage (SMOM) Pathway

Women who present to the Early Pregnancy Unit (EPU) with confirmed miscarriage are given a choice of medical or surgical management. When opting for surgical management, these patients can go home with analgesia and instructions to return to the DSU on a day where there is an elective day case gynaecology list. We have agreement that one of these procedures can be added to any of the 4 elective lists undertaken in DSU per week. When it is not possible to give them a date within 10 days (which is unusual), they are instructed to return to AMU on a day when a surgeon is available. They may then be operated upon on one of our dedicated day surgery emergency lists or await available time on the NCEPOD theatre list. Following uncomplicated surgery, patients are taken to DSU for secondary

recovery and discharge. A dedicated DSU emergency list is preferable as there may be delays waiting for main theatre making same day discharge less likely. A proportion of patients are offered manual vacuum aspiration (MVA) in an outpatient clinic if a skilled operator is available.

Suffering the loss of a pregnancy is upsetting and beyond a woman's control. Supporting these vulnerable patients to remain the privacy of their own home with their own families until the day of surgery may restore a sense of control in their care.

We retrospectively reviewed all cases undergoing evacuation of contents of uterus that were typed as 'urgent' or 'emergency' since March 2008.

Planned ambulatory emergency

This pathway involves any acute surgical presentation and challenges clinicians to consider ambulatory emergency surgery as the norm and not the exception. During a half term in 2017 it was first noted that there were occasionally vacant but fully staffed theatre lists within our day Surgery Unit. It may not be uncommon in other hospital trusts, that during holiday periods there is nursing complement, but no scheduled elective activity due to maximum numbers of medical staff taking annual leave. Once identified by senior nurses at scheduling meetings, these lists are timetabled as 'day case emergency' lists and highlighted to surgical teams in advance. Surgical teams identify patients from the acute take that are suitable for day case surgery and have the opportunity to discharge them with instructions to return to the DSU on a day where there is a dedicated day case emergency list. The teams are comfortable with the process having used the aforementioned abscess and SMOM pathways for many years with a well-established discharge pathway.

There is now growing confidence to 'push' the boundaries of the types of surgical cases successfully performed as ambulatory emergencies. Our approach to achieving this is based on our guidelines for routine surgery. All patients are considered appropriate for day surgery as long as appropriate social support is available and any medical co-morbidities are stable. Patients are excluded if they have on-going sepsis likely to require post-operative support or intravenous antibiotics. The day surgery emergency lists allow a mix of surgical specialities and maintains safety by briefing again if the team changes. There may be an allocated anaesthetist or it may be covered by the on-call team. Care is taken to order the ambulatory emergency list to optimise the chance of successful same day discharge and avoid overrunning into scheduled elective lists. This involves doing more complex operations in the morning or first in the afternoon. In addition to planned patients scheduled onto these lists, if space allows, any other appropriate emergency patients are considered for this pathway. This currently relies on a number of individuals and particularly the anaesthetic emergency team to co-ordinate. There is a tick box on the emergency theatre booking form to prompt surgeons to consider using the day case pathway and ensure that it is considered for all emergency patients booked for theatre. A nursing representative from DSU attends morning handover and asks anaesthetic and surgical teams to identify any patients who are day case suitable.

This cost-neutral pathway reduces bed days, frees emergency theatre time, and increases satisfaction for patients and staff. It also means nursing capability is fully utilised in theatre rather than being drafted to other areas of the hospital, which impacts job satisfaction. Due to its success, surgeons expect to see regular lists and we have now amended our theatre timetable to schedule two dedicated

emergency DSU lists per week. Additional lists are provided on an ad-hoc basis when available. More recently, surgical specialties have sub-specialised limbs of this pathway. Since the end of 2019, an additional urology 'hot list' is also regularly timetabled to deliver definitive management of kidney stones within NICE recommended time frame.

Identifying data retrospectively for this pathway was challenging because all emergency cases were initially added to a single emergency 'e-pool'. We separated those intended as day case emergencies by firstly searching the 'Galaxy' theatre system for all emergency cases who were admitted to DSU on the day of their surgery. A further 'Galaxy' search found emergency cases who were operated on in our main theatres from an inpatient ward but sent to DSU for secondary recovery as per the day case pathway. The pathway was further refined by the creation of a separate 'ambulatory emergency' pool to separate patients at the point of booking onto a day case or inpatient pathway. This is best practice for elective day surgery and is essential to achieve high quality day surgery Replicating this for emergency surgery has improved our pathway by clearly identifying those patients who are being considered for Ambulatory Emergency Care and ensuring that they are scheduled at an appropriate time and in an appropriate location.

Opportunistic streamlining of acute surgical inpatients

Surgical or anaesthetic teams may opportunistically identify existing inpatients who are suitable for discharge on the same day as their emergency surgery. They can undergo their surgery in any theatre before being discharged via DSU. We have seen a change in theatre culture, where day surgery teams with ad hoc gaps will contact the on-call team looking for 'day case emergencies.' Teams proactively identify any day surgery list which might finish ahead of schedule so that timely co-ordination with on the on-call team allows pulling a suitable case off the emergency list.

When looking at data for this cohort, patients will have a LOS of more than 0 days on account of their admission. Therefore, we have looked at whether they are discharged on the same day as their surgery.

Results

Evaluation

Abscess pathway

In 12 years, a total of 1831 patients underwent incision and drainage of an abscess. In 2019, 61% (113) of patients had a length of stay of 0 days. A further 12 patients were discharged on the same day as surgery, saving a total of 125 postoperative bed days in one year (Table 2). Our day case rate saw a steady increase from 2008, with a peak of 70% in 2015 before its plateau (Graph 1). On the day after their operation 90.5% (420/464) reported feeling 'good' or 'very good' with 87.2% (402/464) having no pain or mild discomfort only. Only 3% of patients felt nauseated, with 3 cases (0.6%) of reported vomiting.

Surgical management of miscarriage

There were 1540 cases in 12 years, with 1102 (72%) successful planned day case emergencies. Overall, 80% of women were able to go home on the same day as their surgery (Table 3). Over 12 years the day case rate has usually been high (peak 82%) but shows variability and a recent decline to 55% (Graph 2). The number of patients admitted has not changed dramatically but there has been an overall

reduction in the number of cases managed surgically (83 patients, compared with a mean of 140 per year in the last 10 years). It appears more women are opting for medical management and there is also a proportion of patients who are able to have MVAs in outpatient clinic. This may support a trend of healthcare services moving into the outpatient setting and unburdening acute hospitals. The patients who have moved "down the intensity gradient" to the outpatient clinic would all be patients who were previously managed via a day case pathway. This reflects an improved service for these patients but may initially result in "apparent" reduction of the percentage of patients managed via a day case pathway. Notes review of the patients who required admission during 2019 revealed they were clinically unstable with many requiring blood transfusion. The day after surgery 86.2% (293/340) of women reported feeling 'good' or 'very good.

Planned ambulatory emergency

Between April 2017 and January 2019 (22 months) 442 patients (18 children, 424 adults) underwent emergency surgery via this pathway. It freed 386 hours of emergency theatre time. There was a wide range of surgical specialities (Graph 3) with the majority of cases being general surgery, obstetrics and gynaecology or trauma. 370 patients (83.7%) were successfully discharged on the day of surgery and 301 patients (68.1%) avoided a pre-operative night stay. This saved 671 bed days with estimated cost of £268,400. The day after surgery, 90% of 257 patients (58.1%) followed up by telephone reported feeling 'good' or 'very good'.

Using this pathway, surgeons have been able to successfully plan emergency laparoscopic cholecystectomies, appendicectomies and gynaecological laparoscopies as day cases. The pathway's impact can further be evaluated by looking at all emergency laparoscopic cholecystectomies and appendicectomies that have taken place since its introduction in 2017 (Table 4 and 5). The proportion of patients with a LOS of 0 or discharged on the same day as surgery is on the rise. The BADS directory of procedures sets a target of 25% for emergency laparoscopic cholecystectomies. While our true day case rate in 2019 was 19%, when including those who are discharged on the same day of their surgery this increases to 30% (Table 4). Features of successful discharge were being admitted to DSU on the day of surgery, having surgery in the morning and being operated on by a consultant surgeon. Of those who were already inpatients 75% required admission following surgery. Consultant anaesthetist presence did not appear to influence discharge rates nor did the type of anaesthetic.

Opportunistic streamlining of acute surgical inpatients

We identified inpatients who underwent emergency surgery in any theatre and were sent to DSU after primary recovery. There were 141 patients over 22 months (April 2017 to January 2019) and 75% were discharged on the same day as their surgery. Opportunistic emergency surgery took place in every operating theatre, optimising efficiency and resulting in patient discharge.

Discussion

Ambulatory emergency surgery should be considered as an option at any stage of a patient's journey. At Torbay hospital it is successfully facilitated through a number of pathways with a common goal. Ideally admission is avoided altogether but appropriately selected inpatients are streamlined to save post-operative stays.

Pathways can be tailored to serve individual patient groups or presenting conditions. Engaging the relevant stakeholders is key. A champion on the upper GI team has motivated others and the enthusiasm has spread to the urology team. The benefits are clear; reduced bed days, freed emergency theatre hours, increased patient satisfaction and better staff morale. DSU staff fed back that they feel they are offering a good service to patients using the day case emergency pathway. Data supporting this message can be presented to hospital management to push back against 'bedding' DSU spaces during times of bed crisis. It shows the DSU needs to remain running, not only to keep on top of elective waiting lists but also to relieve pressure from the acute hospital. Where there is no standalone unit, an acute medical or surgical unit could function as part of a day case emergency pathway. The pathway currently relies on individuals to co-ordinate and we are exploring the possibility of a day case emergency coordinator to work in a role that is similar to a trauma coordinator.

Day case emergency surgery has proved to be sustainable as seen in the last decade's data and its scope continues to broaden. The authors believe up to 75% of the acute surgical take has the potential to be undertaken as day case surgery when there is a robust day surgery pathway.

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