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Welcome to the September edition of *Ambulatory Surgery*. As the summer season rolls into the fall, the IAAS has been busy with forthcoming developments. Plans are afoot to develop another online meeting with a shortened programme imminently, but the major reason for promoting this is the planned international Congress taking place in Bruges, Belgium, in 2022. The dates are pencilled in as 30th May to 3rd June 2022, and promises to be an exceptional Congress covering every facet of ambulatory care in the 21st century. It's well worth booking in your study leave now, and thinking about submitting an abstract for the Congress. More details will be uploaded onto the IAAS website in due course.

This edition begins with a statement from the President, President Elect and Immediate Past President arising from the last on-line meeting. The impact of the COVID-19 pandemic on surgical waiting lists and times has been profound and the statement advises Authorities that Ambulatory Surgery offers a prompt and cost-effective method to alleviate these concerns.

Coincidentally, there are two papers on the use of the laryngeal mask airway (LMA) in Ambulatory Surgery. One questions whether there should be a specific scoring system to predict difficult placement of LMAs, while the other is a study evaluating the use of reinforced LMAs in a paediatric population undergoing tonsillectomy or adenoidectomy. For the latter, the authors found a reassuringly low incidence of complications related to mask use.

The third paper is an evaluation of a Daycase Trauma Pathway for orthopaedic patients initiated in a Welsh hospital. The authors had previously reported an audit on developing this service in this Journal (*Ambulatory Surgery* 2017;23.4:87-9) and they present their findings in this paper. Following a review over a 29 month period, they had increased their same day discharge rate to a creditable 52%, with a greater proportion of limb fractures requiring overnight stay. The authors recognise the limitations of their study with only 4 afternoon trauma lists available for use, making the argument for dedicated daycase lists compelling.

The final submission is a little unusual as it takes the form of an advertising feature promoting the use of trolleys within the ambulatory environment surpassing operating tables and beds for the peri-operative period. This is the norm in the United Kingdom and the paper makes a well balanced argument for the use of trolleys to be made more widespread elsewhere. In my view, it's well worth a read.

In conclusion: Please keep forwarding your papers for review and possible publication. The rate at which they have been received has slowed recently, I suspect as a consequence of the COVID pandemic where clinicians are obliged to manage more urgent priorities. As we see a progressive reduction in the prevalence of this disease, I'd hope we'll soon return to the norm of a healthy journal publishing the best in contemporary ambulatory care.

Dr Mark Skues
Editor-in-Chief

IAAS Statement on the COVID pandemic

Professor Douglas MacWhinnie President, International Association for Ambulatory Surgery

Dr Carlos Magalhães President Elect, International Association for Ambulatory Surgery

Professor Beverly Philip Immediate Past President, International Association for Ambulatory Surgery

It is more than a year since the WHO declared the COVID-19 outbreak a global pandemic. Surgical activity was significantly decreased or suspended in affected countries as the surgical pathway was reconfigured to ensure patient and clinician safety. The resumption of surgical interventions and procedures followed the introduction of widespread and targeted COVID-19 testing and vaccination programmes should permit an eventual return to pre-COVID-19 levels of activity.

In many countries, however, the accumulated backlog of surgical patients awaiting operation is at an all-time high. Furthermore, many patients have been reluctant to seek surgical help during the pandemic due to safety fears and this is reflected in the low number of surgical referrals from primary care in this period. As a result, this covert cohort of potential patients awaiting operation has not yet been accurately quantified, but it seems likely that the backlog as currently measured is a significant underestimation of future demand. A return to pre-COVID levels of activity using the traditional inpatient hospital pathways will never clear this global backlog. Extending the working week through extra

evening and weekend operating sessions may be limited by staff or bed restrictions and may prove too costly for many healthcare systems. As COVID-19 eventually comes under control, patients will again demand shorter waiting times and alternative strategies are required.

Ambulatory surgery offers a cost-effective and quality pathway for both patient and hospital, and remains an underutilized option for routine elective surgery worldwide. This is a timely opportunity to demonstrate the value of Ambulatory Surgery as a key component of any strategy to combat the global backlog, by maximizing the number of recognized ambulatory procedures performed, and by introducing new ambulatory procedures to a hospital's portfolio.

The IAAS encourages all our members to assist in this task of promoting Ambulatory Surgery both locally, in their own hospital or healthcare environment, and where possible, by lobbying regional and national providers of healthcare. In this way, we can all participate in reducing waiting times for much-needed surgery, and offer our patients the safe and quality experience they deserve.

Should we have a Score to Predict Difficult Laryngeal Masks Placement? Two Case Reports

F. Costa, R. Arantes, C. Ferreira, J. Alves, E. Soares

Abstract

Laryngeal masks (LMA) are supraglottic airway devices used in the operating room. Although placement success is generally high, no study demonstrates 100% effectiveness. The "RODS" mnemonic (Restriction, Obstruction/Obesity, Disrupted/Distorted anatomy, Short thyromental distance) can be used to predict difficulty in placing LMA. We present two case reports of difficult LMA placing.

Case 1: 58-year-old female scheduled for phaco-vitrectomy. No stigma of difficult airway. No "RODS" characteristics found. Attempts were made to place a size 3 and 4 i-Gel LMAs but ventilation was not effective. Then, we tried to place the size 4 i-Gel LMA using laryngoscopy, this time successfully.

Case 2: 80-year-old female scheduled for vitrectomy, without difficult airway or "RODS" predictors. An attempt was made to place a size

Keywords: Laryngeal mask, Ambulatory surgery, Difficult laryngeal mask placement.

Authors' Address: Anesthesiology Department, Hospital de Braga, Portugal.

Corresponding Author: F. Costa, Anesthesiology Department, Hospital de Braga, Portugal. Email: fabiocosta68953@gmail.com

4 wired laryngeal mask, but it did not fit well. Then we tried a size 5 reinforced laryngeal mask but, similarly, it did not seal adequately. Afterwards, we decided to try size 4 i-Gel LMA, without success. Finally, we decided to intubate with a size 7 endotracheal tube (ETT) with direct laryngoscopy.

Although the best way to protect the airway is ETT, in the ambulatory setting there are many advantages of the LMAs over ETT. The correct placement of an LMA is not always easy. In these two cases we found that RODS was not predictive of the difficulties we experienced, so we suggest that a specific scoring system (not exclusively based on RODS) should be studied and validated for patients in whom LMA placement could be suspected difficult.

Introduction

Laryngeal mask airways (LMA) are single-use or reusable supraglottic airway devices introduced into clinical practice in the 1980s by Dr. Archie Brain (1). Since its introduction, several modifications, additions, and variations have been developed, and are currently in use. Initially they were used predominantly in the operating room but have become widely used in the intensive care unit, emergency department and field settings. Although placement success is generally high, no study demonstrates 100% effectiveness and alternate airway management maneuvers may be necessary (1). The mnemonic RODS can be used to predict difficulty in either placing an extraglottic device or in providing adequate gas exchange through one. RODS stands for Restriction, Obstruction/Obesity, Disrupted or Distorted anatomy, and Short thyromental distance (2). The approach to difficult LMA placement varies between anesthesiologists. Here we present two cases with two different anesthesiologists and their approach to difficult LMA placing.

Case 1

A 58-year-old, 60kg female patient was scheduled for phaco-vitrectomy in ambulatory setting. Pre-anesthetic evaluation revealed depression; without other pathologies or previous surgeries. Evaluation of airway revealed Mallampati 2, with normal cervical mobility and without difficult airway stigmas. Induction of anesthesia was made with propofol and fentanyl. The patient was easily ventilated with face mask. An attempt was made to place a size 4 i-Gel; but as the mask, which was pushed forward, came back, it was thought that the mask was large for the patient and the attempt was repeated using a size 3 i-Gel. However, as size 3 i-Gel LMA was pushed forward and ventilation was initiated, a significant air leakage occurred, and considering that size 3 was small, we again tried using size 4. This time, we performed maneuvers to improve the placement of the laryngeal mask, namely laryngoscopy. This way, we were able to "fit" the laryngeal mask in the right place. Laryngoscopy revealed

Cormack-Lehane score of 1. During intraoperative period, there was no need to readjust the LMA. The surgery lasted for 80 minutes. Meanwhile, consent of the patient was obtained for presenting her case as a case report.

Case 2

An 80-year-old, 64kg female patient was scheduled for vitrectomy in ambulatory setting. Pre-anesthetic evaluation revealed hypertension, hyperlipidemia and deaf-muteness; without previous surgeries. Evaluation of airway revealed Mallampati 1, with normal cervical mobility and without difficult airway stigmas. Induction of anesthesia was made with propofol and fentanyl. The patient was easily ventilated with face mask. An attempt was made to place a size 4 wired laryngeal mask but it didn't adapt well. Then we tried a size 5 wired laryngeal mask but it didn't adapt as well. Insertion of the laryngeal masks revealed very loose tissues. Then, we decided to try i-Gel LMA, without success. Finally, we decided to intubate with a 7 endotracheal tube with direct laryngoscopy. Laryngoscopy revealed Cormack-Lehane score of 1. Surgery went uneventful and lasted for 60 minutes. Meanwhile, consent of the patient was obtained for presenting her case as a case report.

Discussion

In ophthalmology, as well as in other specialties in which the surgeon approaches the head and/or it is difficult for us to handle the airway during surgery, it requires that we ensure an airway in which we reduce the need to replace/readjust it. The best way to ensure a protected airway is, of course, endotracheal intubation. But, in the ambulatory setting, there are many advantages of the LMAs over endotracheal tubes (ETTs). They are tolerated under lighter anesthesia and are less stimulating to the sympathetic nervous system, resulting in decreased risk of cardiovascular events. Furthermore, LMA have a lower incidence of sore throat post-operatively and allow spontaneous ventilation during the procedure. The data comparing

ETTs and SADs showed that there is a significantly shorter time to home-readiness when LMAs are used. In addition, success rates of “intubation” with LMAs have been shown to be over 90% (1).

Although the learning curve is fast and the success rate is high, the placement of an LMA is not always linear. The most common causes of poor LMA placement are inadequate anesthesia/relaxation (pharyngeal muscle and/or laryngeal spasm), failure to negotiate the 90 degrees turn from the posterior pharynx to the hypopharynx, and choice of wrong LMA size. In 2–33% of LMA placements, more than one attempt is required, whether by residents or experienced practitioners, adult or pediatric patients (3).

Therefore, we must keep in mind the RODS mnemonics that allows us to identify, a priori, a difficult LMA placement. RODS stands for Restriction (increased airway resistance as well as restricted mouth opening), Obstruction (tumor or foreign body)/Obesity (redundant tissue and increased ventilatory pressures), Disrupted or Distorted anatomy (airway deviated from the midline makes the device less likely to seat properly), and Short thyromental distance (due to the position of the tongue) (2). When we identify a patient in which, a priori, it will be difficult to place the LMA, we can be forewarned

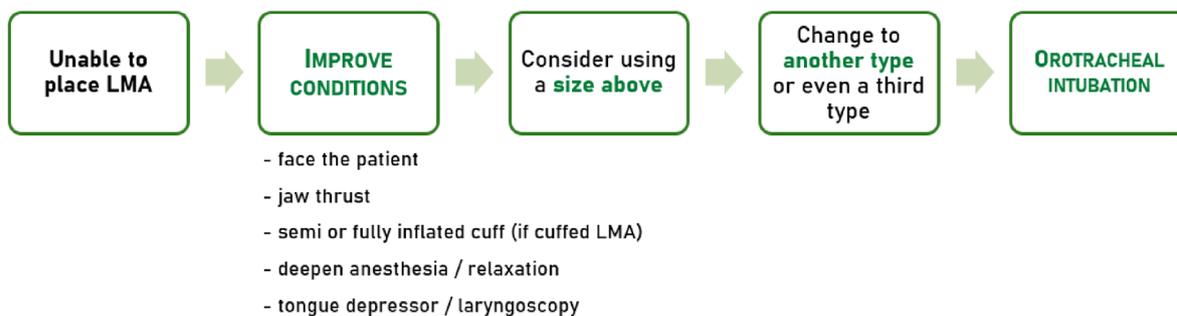
with other sizes of the same type of LMA, other types of LMA and the intubation material prepared to be used.

In the two cases presented here, none of them had, a priori, obvious signs of difficult placement. There are probably other variables that may predispose to laryngeal mask displacement, namely the laxity of tissues as verified in case 2, which does not provide sufficient anatomical support for the correct positioning of the LMA.

Figure 1 shows the proposed approach to difficult placement. When we are unable to adapt the laryngeal mask, we must first consider using a size above. Even with the same type of LMA, there are ways to improve the conditions for placing the LMA: facing the patient, jaw thrust, semi or fully inflated cuff (if cuffed LMA), tongue depressor and laryngoscopy. If repeated attempts with one type of LMA are unsuccessful, changing to another type or even a third type, may work. Ultimately, orotracheal intubation will be the final option (1).

Further studies are required to assess the need for a preoperative score that can predict difficulty in inserting a laryngeal mask. In addition, we question the need for a protocol to approach a difficult placement of laryngeal mask.

Figure 1 Proposed approach to difficult laryngeal mask placement.



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Reinforced Laryngeal Mask Airway in Ambulatory Otorhinolaryngologic Surgery: Tonsillectomy and/or Adenoidectomy in Paediatric Population

Sara Alves, Cristina Gomes, Sandra Caldas, Marta Gonçalves, Joana Ferreira

Abstract

In otorhinolaryngologic procedures, the use of endotracheal tube has been considered the gold standard to maintain the airway. In last years, reinforced laryngeal mask airway (LMA) has been reported as a safe alternative. The purpose of this study was to evaluate the safety of the use of reinforced LMA in tonsillectomy and adenoidectomy in pediatric population.

Keywords: laryngeal mask airway; tonsillectomy, adenoidectomy.

Authors' Address: Serviço de Anestesiologia do Hospital de Braga, EPE, Braga, Portugal.

Corresponding Author: Sara Alves, Interna de Anestesiologia do Serviço de Anestesiologia do Hospital de Braga, EPE, Braga, Portugal.

Email: saralsalves@gmail.com Address: Sete Fontes, São Vitor, Braga, Portugal

In 56 pediatric patients undergoing tonsillectomy and adenoidectomy we evaluated the dose of opioid and neuromuscular used, duration of anesthesia induction and intra and postoperative complications. We concluded that tonsillectomy and adenoidectomy can be safely performed in pediatric population using reinforced laryngeal mask airway.

Introduction

Use of the reinforced LMA and endotracheal intubation are both accepted standards of care used to ensure adequate ventilation during a variety of procedures. In otorhinolaryngologic surgeries, the use of LMA remains controversial because surgical field involves the airway making complications such as laryngospasm, bronchospasm and hypoxemia more likely due to the higher incidence of airway hyperreactivity and the presence of blood and secretions (1).

LMA has gained popularity owing to its ease of insertion and minimal trauma to the trachea because it is positioned superior to the larynx (2,3). LMA decreases the use of neuromuscular blocking agents and opioids and as result may avoid possible side effects, avoids the need of laryngoscopy and some studies reveals improvements in various post-operative outcomes such as sore throat, cough, desaturation, bronchospasm, laryngospasm, pain, stridor and hoarse voice (2-4). Disadvantages of the LMA in upper airway surgery include difficult visualization of the surgical field, leaking or kinking of the device which lead to difficulties in ventilation, problems with oxygenation and the need to change the LMA in favor to endotracheal tube (2).

Previous studies have demonstrated some advantages of the LMA over endotracheal tube for adenotonsillectomy, though most of them have been small studies (5).

The goal of this study is to evaluate the safety of the use of reinforced LMA in tonsillectomy and adenoidectomy, in pediatric population.

Material and methods

After receiving approval by institutional review board, we performed an observational prospective study from April 1st 2019 to October 30th 2019 at the Hospital de Braga, Portugal. Inclusion criteria were pediatric patients proposed to adenoidectomy, tonsillectomy in ambulatory setting and willingness to participate in the study, demonstrated by signing the informed consent by the legal representative. Patients with known malformations of the airway were excluded.

Anesthesia was provided by attending anesthesiologists. Monitoring consisted of pulse oximetry, electrocardiogram, non-invasive blood pressure and capnography. Anesthesia was induced with inhaled sevoflurane followed by intravenous line insertion. Additional propofol, fentanyl with or without muscles relaxants were administered. The choice of endotracheal tube versus LMA was at the discretion of the attending anesthesiologist, and the group of endotracheal tube was excluded of the study. The size of the LMA was determined according to the manufacturer's specifications. After the surgery, patients were sent to the ambulatory PACU.

Surveys were given to anesthesiologists and PACU nursing staff. The type of device used in the airway, the duration of anesthetic induction (time between the beginning of anesthesia and the beginning of surgery), the opioid and dose used in induction, the possible use of muscular relaxant and the possible complications (air leaks, regurgitation/aspiration, surgical field obstruction) during the surgery were reported. In postoperative period, possible complications and re-interventions were evaluated (cough, dysphonia, laryngospasm, refusal to feed and haemorrhage).

Results

Fifty-six children proposed to adenoidectomy and/or tonsillectomy were included in this study and descriptive data population is presented in Table 1.

The LMA group was analyzed and included children with ages between 2 and 12 years-old (media 5.63, standard deviation 3.76). Evaluation of this group revealed that 27 patients were female and 29 were male; 42 patients were classified as ASA I and 14 as ASA II. Based on airway evaluation, 49 patients were classified as Mallampati score I and 7 patients as Mallampati score II. Fentanyl was the opioid of choice in all patients and the media of the dose was 2.4 micrograms per kilo. A neuromuscular blocking agent was administered in only 2 patients (3,6%). Induction time was in media 7 minutes. There was only the need to change the airway device in 1 patient after placing an orotracheal tube due to difficulty in ventilation after mouth opener

Table 1. Descriptive data about the study population.

Age	Min	2
	Max	12
	Median	5.63
Gender	Female	27
	Male	29
ASA	I	42
	II	14
Airway	Mallampati I	49
	Mallampati II	7

and none intra-operative complication was reported, as shown in Table 2. In post-operative time of the LMA group, there were 10 cases of complications: 2 cases of cough and in 7 patients' refusal to feed during the recovery period and in 1 patient mild hemorrhage, but not delaying the discharge of the PACU. Of all the patients studied, none needed re-intervention.

Table 2 Descriptive results of the investigation.

Fentanyl induction dose	Min	1
	Max	4
	Median	2
Use of muscular relaxant		4
Induction time	Min	5
	Max	11
	Median	7
Intraoperative complications	Air leak	1
	Regurgitation/aspiration	0
	Surgical field obstruction	0
Postoperative complications	Cough	2
	Dysphonia	0
	Laryngospasm	0
	Refusal to feed	7
	Mild haemorrhage	1

Discussion

The study results demonstrate that reinforced LMA is preferred for the anesthesiologists of our institution for adenoidectomy and tonsillectomy, in a paediatric population. Based on surgeons' opinion it was clear that LMA did not alter surgical field visualization. In one case, the mouth opening altered LMA position causing difficulties in ventilation and it was necessary to change the airway device. This complication has been reported in previous studies (1,5,6). Lalwani and colleagues reported a failure rate of 6,8% and that younger patients are more likely to have LMA failure (5). There were no respiratory complications in intraoperative period such as bronchospasm, laryngospasm or regurgitation.

The dose of opioid was another point of analysis in this study and we found that in media there were used 2.4 micrograms per kilogram of fentanyl, which is less than the 3 micrograms per kilogram used in endotracheal intubation. This dose reduction can be beneficial in reduction of side effects of opioids such as sedation, nausea and vomiting.

In our institution neuromuscular agents are used in almost all cases with endotracheal intubation and in the patients of our study there were only two cases of neuromuscular block in LMA group. Avoiding neuromuscular blocking agents is essential for prevention of postoperative residual curarization.

The induction of general anesthesia the LMA typically takes less time to insert than an endotracheal tube and more time is usually required to extubate a patient with endotracheal tube fully awake. Analysis of the time of induction was another point of the study and we found a very short period (media of 7 minutes). Previous studies had analyzed the time in operating room and failed to demonstrate significant reductions in LMA group if compared with endotracheal intubation groups.(5,7,8)

Previous studies suggested that LMA protects the airway against blood, secretions and debris in ear, nose and throat procedures and that can contribute to the reduction of laryngospasm after extubation (5). In fact, in LMA group there were no laryngospasm reported after anesthesia emergence.

Our investigation has limitations as a result of its observational nature without an endotracheal intubation control group. Our findings cannot be applied to patients with abnormal airways because these patients were excluded of the study. Further investigation is needed with large randomized studies to reinforce the conclusions described here.

Conclusions

We concluded that the use of reinforced LMA in adenoidectomy and tonsillectomy is safe option in pediatric population, with low incidence of complications.

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Evaluation of a Newly Developed Day-Case Trauma Pathway in a Rural District General Hospital

AM Bamanja, F Belfield, N Deshmukh

Abstract

According to the recommendations by The British Association of Day Surgery, a day case trauma pathway was formulated in Wthybush hospital, a rural district hospital in west Wales. This pathway underwent multiple Plan-Do-Study-Act (PDSA) cycles to which lead to appropriate beneficial changes to it through implementation, revision, and reimplementation. In a

retrospective analysis, a same-day discharge rate of 52% was found. The most common reasons for overstay were identified as patient post-operative health-related issues which mainly included postoperative pain, nausea and vomiting, and inability to carry out activities of daily living. We plan to take further steps improve the efficiency of this pathway.

Keywords: Day Surgery, Orthopaedics, Quality improvement.

Authors' Address: Department of Trauma and Orthopaedics, Wthybush General Hospital, Haverfordwest, Wales.

Corresponding Author: Dr. Ashish Mradul Bamanja, K-16, Kensington Block, Wthybush General Hospital, Fishguard road, Haverfordwest, SA61 2PZ, Wales.

Email: ashishbamaia95@gmail.com

Introduction

Day surgery is gaining popularity in the modern-day hospital setting. The British Association of Day Surgery (BADs) suggests that emergency surgical cases (including trauma) should ideally be performed in a Day Surgery setting [1]. It improves patient experience (shorter length of hospital stay), ensures bed availability for other sick patients, simultaneously being economically beneficial for the hospital.

Wthybush hospital is a district general hospital situated in the coastal town of Haverfordwest. It caters to a population of approximately 375,000 in Pembrokeshire, Carmarthenshire, and Ceredigion (Hywel Dda University Health Board) in west Wales. This figure is greatly increased during the summer months due to the area being popular with tourists.

This 195 bedded hospital has four operating theatres including an emergency theatre. The self-contained Day Surgery Unit comprises two post-operative bays with 11 patient spaces. There are two theatres (one for cases under general anaesthesia, with an anaesthetic room, and another for cases under local anaesthesia only). It contains three 1st stage recovery bays as well.

Given the benefits of day surgery, a new day case trauma pathway was developed in Wthybush hospital in July 2017. The pathway went through multiple PDSA (Plan-Study-Do-Act) cycles which lead to appropriate beneficial changes to it through implementation, revision, and reimplementation.

The current pathway is implemented as the following flowchart suggests. (Figure 1). The need for surgery is assessed by a doctor when a patient attends an orthopaedic outpatient clinic or fracture clinic. The assessing doctor completes the patient pathway for trauma admission (Figure 2). These patients are screened by a nurse for suitability as a day case procedure. A pre-operative health screen questionnaire is filled in which includes the patient's current physiological status, past medical history, medications, allergies, smoking history, and history of Cruetzfeldt-Jacob disease (Figure 3). If suitable, the patient is booked for a procedure after liaising with the day surgical unit. An information leaflet is provided to the patient and fasting instructions are given. Otherwise, the patient is admitted as an

inpatient for surgery after liaising with the assessing doctor and the bed manager.

We aim to evaluate this newly developed day-case trauma pathway in terms of patient demographics, compliance, and its limitations. We expect that results from the evaluation will bring about suitable changes in the pathway. This will make the pathway more efficient and improve our quality of care.

Methods

We conducted a retrospective analysis to assess the number of successful emergency trauma patients treated on a day case basis. All the patients who underwent day-case surgery with the orthopaedics department from July 2017 to December 2019 were included. Patients' notes were collected from the hospital's case notes library. Demographic details (age and gender) and type of injury sustained (upper limb injury/ lower limb injury/ upper limb fracture / lower limb fracture) were noted. Outcomes were recorded as to whether the patient was discharged on the same day of admission and surgery, or not. The reasons for the overstay of patients were noted from doctors' and nurses' documentation. Patients with incomplete documentation were not excluded from the analysis.

Mann-Whitney-U test of statistical significance was used to compare median age differences between same-day discharged and non-discharged patients. Chi-Square test of statistical significance was used to compare the patient gender, and type of injury sustained, to their discharge outcome, respectively. P values of less than 0.05 for associations were considered to indicate statistical significance.

Results

From July 2017 to December 2019, 240 patients were identified with Trauma & Orthopaedics department, suitable as emergency day surgery cases.

52.5% of patients were female (126/240). The median (range) age of all patients was 48.5 (15-92) years. 124 (51.7%) patients were admitted with upper limb fractures and 44 (18.3%) patients were

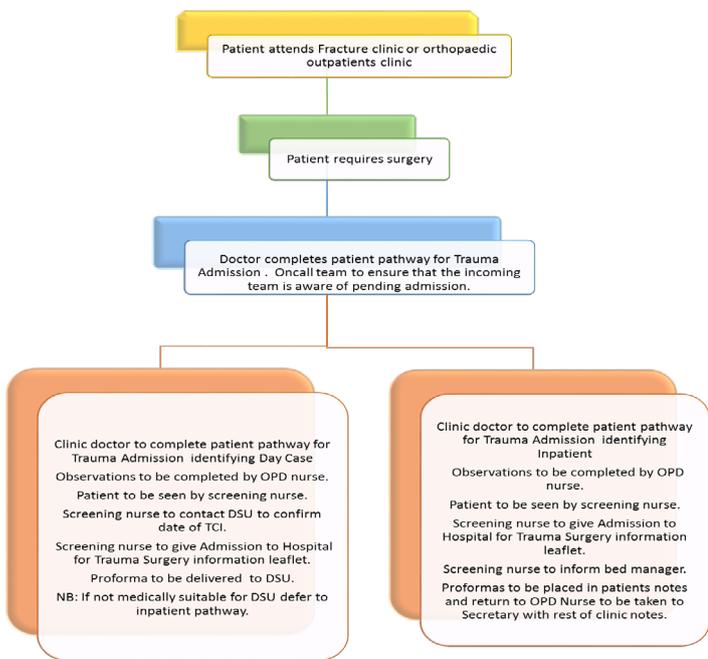


Figure 1 Day Surgery Trauma Admission Pathway from Fracture Clinic and Orthopaedic Clinic.

**HYWEL DDA UNIVERSITY HEALTH BOARD
WITHYBUSH GENERAL HOSPITAL**

PATIENT PATHWAY FOR TRAUMA ADMISSION

This form should be completed for all patients where surgery is proposed

SURGEON TO COMPLETE RED AREAS

ADDRESSOGRAPH Date of outpatient appointment _____

Consultant _____

Seen By _____

Date of Surgery if known _____

Telephone Numbers (Home) _____ (Work) _____ (Mobile) _____

PROPOSED SURGERY/ DIAGNOSIS LA / GA / REGIONAL / SEDATION

Date to be treated by _____ Suitable to be treated on elective list Yes / No

CONSULTANT/ DR Signature _____

OBSERVATIONS

Weight Height BMI

Pulse

Blood pressure BP 2nd reading if raised

Nurse signature _____

Lower Limb injuries only VTE Risk Assessment completed by DR YES NO (if not why? _____)

Special requirements (please state) _____

Equipment required: (please state) _____

Company rep: to be present? _____

Is the procedure categorized as: Day Case (Main Theatre) Inpatient

REASON FOR ADMISSION AS INPATIENT
(If procedure categorized as Day Case) _____

NURSE TO COMPLETE ASSESSMENT ON BACK TO CONFIRM PATHWAY

Figure 2 Patient pathway for trauma admission.

admitted with other upper limb injuries. 38 (15.8%) patients had lower limb fractures and 24(14.2%) patients had other lower limb injuries on admission (Figure 4). 48 % (115/240) of total cases could not be discharged on the same day.

The Median (range) age of non-discharged patients was 53 (17-92) years.

PRE –OPERATIVE HEALTH SCREEN QUESTIONNAIRE
 Please answer the questions by ticking (✓) your answer

- Do you take any Medicines, Tablets or Inhalers Yes / No
If yes, please list them below (include oral contraceptives and HRT)
.....
.....
- How far can you normally walk without stopping?
 - More than one flight of stairs
 - One flight of stairs
 - Half a flight of stairs
 - Around the house
- What stops you going further?
 - Joint pain
 - Chest pain
 - Shortness of breath
 - Something else. Specify.....
- Do you get chest pain?
 - No
 - When in a hurry
 - In cold or windy weather
 - After food
 - At other times. Specify.....
- Do you get short of breath when you
 - Lie flat
 - Walk on the flat
 - Walk up a flight of stairs
 - None of these
- Have you ever had or have any of the following? Yes / No
 - Heart attack
 - Heart surgery
 - Hypertension
 - Stroke / Mini stroke
 - Asthma / COPD
 - Diabetes
 - Blackouts / Fits
 - Chemotherapy / Radiotherapy
 - Anticoagulation treatment such as Warfarin, Aspirin, Clopidogril (plavix) Dipyridamole (persantin / asasantin)
 Reason for taking _____

Have you ever been informed are at risk/or have had CJD YES/NO _____

Any other health reasons patient is seeing a different Consultant /GP _____

Allergies...and...Sensitivities...including LATEX.....

Smoker Yes / No How many per day _____ Ref to smoking cessation nurse YES Declined Information given _____

Day Surgery Patients Only
 MRSA swabs taken YES NO N/A

Figure 3 Pre-operative health screen questionnaire.

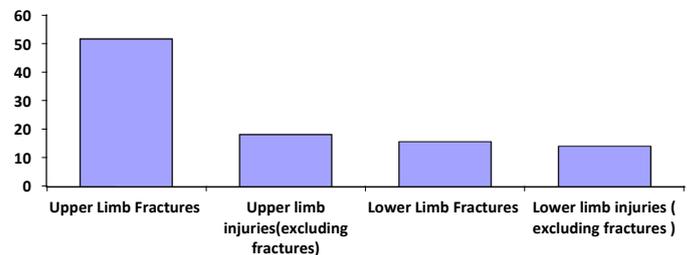


Figure 4 Types of injuries in admitted patients.

There was a significant difference in the median age of non-discharged patients (53) and discharged patients (42) [$z=-2.8$, $p<.01$, Mann-Whitney-U test of statistical significance]. 60% (69/115) of non-discharged patients were females. A chi-square test of independence showed that there was a significant association between gender and discharge outcome [$X^2(1, N = 240) = 4.98$, $p = .02$] (Table 1).

Table 1 Chi-square test results:Association between gender of patients and their discharge outcome.

Gender	Discharged Observed/ expected/ χ^2	Not discharged Observed/ Expected/ χ^2	Row Totals
Male	68 (59.38) [1.25]	46 (54.62) [1.36]	114
Female	57 (65.62) [1.13]	69 (60.38) [1.23]	126
Column Totals	125	115	240

The discharge rate for patients with lower limb fractures was the lowest (65.8% [25/38] patients staying overnight). This was followed by patients with upper limb fractures where 55.6% [69/124] of patients stayed overnight. 32.4% [11/34] and 22.7% [10/44] of patients, with lower limb injuries and upper limb injuries, respectively, stayed overnight (Figure 5). A chi-square test of independence was performed to examine the relation between the type of injury and the discharge outcome. The relation between these variables was significant. $[X^2 (dF=3, N = 240) = 22.3, p < .01]$ (Table 2).



Figure 5 Types of injuries in patients and their discharge outcomes.

Table 2 Chi-square test results: Association between gender of patients and their discharge outcome.

Type of Injury	Discharged Observed/ expected/chi ²	Not discharged Observed/ Expected/Chi ²	Row Totals
Upper limb injuries	34 (22.92) [5.36]	10 (21.08) [5.83]	44
Upper limb fractures	55 (64.58) [1.42]	69 (59.42) [1.55]	124
Lower limb injuries	23 (17.71) [1.58]	11 (16.29) [1.72]	34
Lower limb fractures	13 (19.79) [2.33]	25 (18.21) [2.53]	38
Column Totals	125	115	240

60% (69/115) of non-discharged patients had upper limb fractures. 21.7% (25/115), 9.6% (11/115), and 8.7% (10/115) of the non-discharged patients had lower limb fractures, lower limb injuries, and upper limb injuries, respectively (Figure 6). The most common of reasons (47.8%, 55/115) for overstay were patients' postoperative health related issues which majorly included postoperative pain, nausea and vomiting, and inability to carry out activities of daily living. 20% (23/115) of patients had a late return from theatre, preventing same-day discharge. 15.7% (18/115) of patients were delayed because of hospital issues (unavailability of beds, prioritization of sick patients for surgery). 7.8% (9/115) of patients had combined patients' postoperative health-related and hospital-related issues. 3.5% (4/115) of patients had social issues impeding discharge. Reasons were not specified in patients' case notes for 5.2% (6/115) of non-discharged patients (Figure 7).

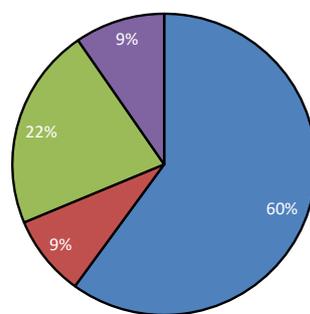


Figure 6 Types of injuries in non-discharged patients.

- Upper Limb Fractures
- Upper Limb Injuries (excluding fractures)
- Lower limb fractures
- Lower limb injuries (excluding fractures)

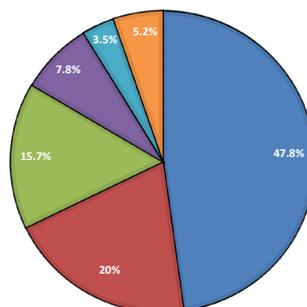


Figure 7 Reasons for delayed discharge of patients.

- Patients' postoperative health related reasons
- Late return from the theatre
- Hospital related issues
- Combined patients' postoperative health and hospital related issues
- Patients' social issues
- Reasons not specified in patient notes

Discussion

In a small district hospital, a day surgery pathway can have several benefits. Improvement in the pathway leads to lower costs to the health board as the patient stay is reduced. As the hospital caters to the geographical area which attracts tourists due to its landscape and natural terrain, there is an increased number of patients who require orthopaedic admission due to their injuries. This pathway assists in managing the inpatient beds by 'freeing them up' and utilizing the day surgery.

Since the start of the day surgery pathway, there has been significant improvement in the discharge rate over this period in comparison to our previously published results. For the initial 11 months after the pathway was implemented, the discharge rate of 5.2% (1 discharged out of 19 patients admitted for day surgery) was noted [2]. An increment of 42.8% in discharges signifies that the patient care via this pathway is improving. A reason for this can be increased awareness about the pathway amongst healthcare workers who are part of the day surgery unit, and rising confidence amongst surgeons to deal with patients as a day surgery case. Notably, one of the keys to the success of this pilot project is the function of the pre-assessment services leasing with the day surgery unit, liaising with the orthopaedic surgeons, and scheduling patients appropriately.

There are certain limitations to this pathway in our hospital. Unlike in larger hospitals, we only have a small on-call trauma team consisting of a consultant, a registrar, and a senior house officer/foundation year doctor. With a rigid schedule and commitment of senior doctors to clinics, perfect implementation of the pathway is impaired.

Also, as the trauma lists run only in the afternoons of weekdays (excluding Thursdays), this leads to the cancellations of cases, as the major trauma cases take priority. This is a compelling argument for a dedicated day case trauma list.

The limited number of operating surgeons and anaesthetists, along with the number of theatres and capacity of DSU limits the good implementation of the pathway as well.

As changes take time to occur in a slowly evolving system, effective and continued communication can help in the continued success of this pathway which has become established within the department. Our recommendations for improvement of this pathway includes a dedicated day case trauma list and organization of regular sessions for the education of the involved new and established staff to ensure full utilization of this pathway and better optimization of patients' conditions. A focus on meticulous pre-assessment of patients may limit delayed discharges due to social reasons. Lastly, we also plan to improve patient notes documentation and record-keeping to limit missing data.

In the current situation with COVID-19, we are unable to treat patients within the day surgery unit. However, the pathway is still

functioning within the pre-assessment service delegating all patients through the inpatient pathway regardless of their status as day case or inpatient. Hence, currently, the day surgery unit remains non-functional. When the situation changes, we aim to increase our discharge rate, without compromising on the quality of care and patient satisfaction, with the help of the clinical personnel involved. We plan to re-audit after we have placed these measures for further development of the pathway.

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Advertising Feature: The Role of Ambulatory Surgery Trolleys in the Day Surgery Pathway

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Ambulatory surgery is an integral part of modern health service where medical services are organised around the needs of the patient with the aim of efficiency of service provision, cost reduction and minimising the impact of surgery upon the individual.

Ambulatory surgery should ideally be provided in a self-contained unit that is functionally and structurally separate from inpatient wards and operating theatres. These facilities can be configured in several ways, but all require a day ward, operating theatres, and a recovery area. The operating theatre and first-stage recovery areas should be equipped and staffed to the same standards as an inpatient facility, except for the use of trolleys rather than beds. The purpose-built day surgery trolleys can provide all the functions of a bed, trolley, and operating table together. These trolleys accompany the day surgery patient throughout the entire patient journey before transfer to a chair to complete second-stage recovery. Considerable time savings can be made in the theatre pathway by avoiding trolley transfers. Several patients per day can occupy the same trolley space, providing a streamlined turnaround time.

The ambulatory surgery unit should have no capacity to accept overnight admissions. Clear agreements should be in place to ensure it is not used for emergency inpatient care. Providing short stay beds for elective surgery into an ambulatory surgery unit can jeopardise outcomes for day surgery patients by making it relatively easy for a patient to be admitted to one of these beds overnight, hence the drive to facilitate same day discharge may be compromised (1).

Day surgery facilities not having any beds or facilities to enable overnight stay (e.g., showers) not only encourages day surgery discharge but prevents medical overflow at times of escalation (2).

Specialist patient trolleys that can be utilised for transport, treatment and recovery of day-case patients are now a prerequisite to run an efficient and streamlined ambulatory surgery pathway.

The International Association for Ambulatory Surgery (IAAS), in its *Day Surgery Development and Practice*, published in 2006 (3) mentions that

‘Trolleys, beds and operating tables: Hospital beds have no place in the management of true day surgery cases as they are cumbersome to move and, being wider, take up more space than trolleys. Equally, for the majority of surgical procedures, traditional operating tables should not be used. Modern comfortable operating trolleys combine the mobility of a trolley with all the attributes of an operating table. They can tilt both ways, be raised and lowered, have attachments such as stirrups and arm boards fitted, have radiolucent sections and are stable. Most are suitable for a wide range of procedures but particular trolleys are made for certain specialities e.g.: ultra stable trolleys for ophthalmic surgery. Trolleys have the advantage that patients are anaesthetised, operated on and recovered on them. This reduces patient movement for the operating room staff and saves time.’

Ambulatory surgery units that have not moved to day surgery trolleys may still be using a combination of equipment for transfer, surgery, and recovery.

These could be simple transfer trolleys, operating tables, and imaging trolleys (e.g., for orthopaedics). Having a multitude of equipment requires not only an original purchase cost, but also maintenance and utility costs. Other considerations include functionality, user training requirements, reliability, and storage – and that’s without taking any surgical preferences into account.

One needs to take into consideration that, the more equipment options are selected, the more of a challenge it can become when equipping a unit. Specific equipment may have limited availability for use affecting the smooth running of a day surgery list and can lead to unnecessary delays.

Having universal multi-functional day surgery trolleys can help to resolve these questions, offering cost-efficiency as well as contributing to a lower risk of manual handling injuries and hospital-acquired infection.

Key benefits offered when using trolleys tailor made to accommodate day surgery pathway instead of multiple devices to patients on the surgical pathway have been discussed here.

1. Work-related musculoskeletal disorders

Although there is no direct evidence about the proportion of sickness absence linked to patient transfer or patient positioning, manual handling injuries linked to transfer of patients having surgery are known to occur. These can be while transferring anaesthetised patients from trolley to operating table and vice versa as well as helping in transfer of patients from trolley to ward bed before discharge.

Getting It Right First Time (GIRFT) is a national programme designed to improve the treatment and care of patients through in-depth review of services, benchmarking, and presenting a data-driven evidence base to support change. In the National Day Surgery Delivery Pack co-produced by GIRFT members and the British Association of Day Surgery (BADs) and the Centre for Perioperative Care (CPOC), it states (2):

‘Whilst obesity is not a contraindication, theatre personnel should be aware of upper weight limits for trolleys in use. These should be suitable to manage patients across a wide weight range. If operating tables are moved between theatres for this purpose, trolleys are preferable to reduce manual handling risks for staff.’

2. Medical device costs

Multi-functional ambulatory surgery patient trolleys are designed to cater to the day surgery pathway. They can accommodate increasingly complex procedures thus offering cost efficiencies. Instead of purchasing one device to facilitate a single surgical specialty or procedure, a generic albeit purpose-built device can also offer time efficiency (no need to swap equipment) and reduce storage space requirements.

3. Hospital-acquired infections

According to NICE (National Institute of Clinical Excellence), healthcare-associated infections in patients on the surgical pathway incur increased costs and are a financial burden. Hospital acquired infections require additional use of NHS resources, greater patient discomfort and a decrease in patient safety. Every medical device employed in the same-day surgical pathway carries a potential risk of infection or cross-infection. Utilising the Ambulatory Surgery Patient Trolleys with fewer transfers minimise this risk.

4. Waiting times for patients needing elective surgery

The challenge to reduce operation waiting times, even to pre-pandemic levels, cannot be underestimated, and the adoption of more same-day surgery is already being explored as part of the solution. Using one device for transport, treatment and recovery eliminates the need for transfers, offering time efficiencies – and therefore increased list capacity.

A study published in *The Orthopaedic Journal at Harvard Medical School* in 2017 (4) looked specifically at potential efficiencies of using surgical trolleys rather than operating tables for certain hand procedures. It concluded:

'This study demonstrated that through the use of a stretcher-based hand table, OR efficiency can be improved. Based on modeling, this could return an annual savings of \$46,335 per surgeon for isolated carpal tunnel and trigger finger releases. Additionally, the table made a favorable impression upon the OR staff, with 72% preferring the stretcher-based hand table and 100% thinking it improved efficiency.'

Patients on the day surgery pathway are usually admitted to an admission lounge and may be seated in a chair. Once admitted, assessed and the patient has changed into their theatre gown, they usually walk to the theatre or may be transferred in a wheelchair or trolley to the anaesthetic room. Post-surgery the patient is transferred into recovery on the trolley, then back to the day ward or discharge lounge. When recovered sufficiently, patients may move to a discharge lounge equipped with chairs. The trolley can then be cleaned, disinfected, and returned to the pathway cycle for the next patient. This practice is applicable to both self-contained unit and its operating theatres only a short distance away or the transfer to the operating theatre involving a lengthier journey along corridors.

In the United Kingdom, using purpose-built day surgery trolleys is an established practice. It demonstrates that the approach is proven, successful and reliable, having been in place for over two decades. Despite this, there is no accredited specification for such devices, either UK or internationally (e.g., BS EN ISO), so individual manufacturers have set their own parameters depending on the level of investment in design and development they have been prepared to make.

Additional benefits of the 'one-device' approach for transport, treatment, and recovery:

i) Ease of training

With only one device for transfer, surgery, and recovery - the time required for user training is kept to a minimum

ii) Ease of scheduling

Purchasing of the correct number of devices will ensure the daily pathway cycle can be maintained, and surgery scheduling is kept as straightforward as possible.

iii) Ease of procurement

The NHS is currently striving towards sustainability and reducing carbon footprint. Green procurement from supply chains with reduced carbon footprint is a preferred option.

iv) Increased free space

A universal trolley will negate the need for storage space to be taken up with devices for specific surgical specialties or specific procedures leaving it free to be repurposed.

Some of the key attributes for ambulatory surgery patient trolleys are:

1. Light weight

If the device is to be moved within a day unit with a patient on board, it must be designed to be as light as is feasibly possible to produce. Ideally it will be light enough in itself to allow one member of staff to move it, with a patient onboard, so as not to become a drain on staffing resources or potentially cause a manual handling injury.

2. Manoeuvrability

Trolleys for ambulatory surgery should be easily manoeuvrable with low rolling resistance and equipped with a steering function to aid transfer and provide an ergonomic pushing position. In the UK the HSE states that push / pull forces in the workplace should not exceed 20kg of force to start motion and should not exceed 15kg whilst in motion. This is an important factor to consider when aiming to minimise manual handling injuries.

3. Powered functions

To reduce the risk of manual handling injuries and provide even easier usage and safety for practitioner and patient alike, powered functions should be available to alter patient trolley height and change various trolley positions such as head up, head down and lateral tilt.

4. Low height

The patient trolley height, when at its minimum height setting, should be low enough to minimise the need for staff intervention when a patient is getting on or off the trolley. This again minimises the risk of a manual handling injury and improves patient comfort and safety.

5. Surgical versatility

To ensure the ambulatory surgery patient trolley meets the brief of a one-device approach, it should be surgically versatile enough to be suitable for a wide range of procedures and to accommodate surgical preferences.

6. Radiolucent

The patient trolley needs to be radiolucent, and its design must allow for full imaging device access.

7. Tissue viability

The day surgery trolley mattresses must be to an appropriate specification to enable up to 23 hours of use to ensure tissue viability issues do not arise.

8. Infection control

The trolley must be quick, easy, and convenient to clean. It's design and materials employed should show it supports this aspect.

9. Reliability

Same-day surgery has to run as a lean equipping process to remain cost-effective, so any equipment downtime will have a negative impact on efficiency and productivity. The device must be robust and reliable.

Summary

The use of ambulatory surgery patient trolleys in a day surgery pathway is now a prerequisite rather than a preference. Its use negates the need to move unconscious patients, thus reducing the risk of injury to patient and staff. It is easier to move between areas reducing staff injury. The trolleys are unlikely to be used for “emergency in-patients” in a bed crisis. As the trolleys are perceived as a temporary resting place, patients usually mobilise quicker instead of making themselves comfortable in a bed. There are reduced time delays transferring patients from trolley to operating tables as well as reduced postoperative nausea and vomiting associated with rolling and transfer.

Ambulatory Surgery Units that are looking to expand or set up for the first time, can source the equipment with confidence if there is published guidance on minimum specifications required in an ideal ambulatory surgery patient trolley.

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Further Reading

- Organisation for Economic Co-operation and Development (OECD) – Health/Health Care Utilisation/Surgical procedures - <https://stats.oecd.org>
- International Association of Ambulatory Surgery (IAAS) – *Streamlining the Day Surgery Pathway*
- International Association of Ambulatory Surgery (IAAS) – *Ambulatory Surgery Handbook 2nd Edition* (2014)
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- National Institute for Health and Care Excellence (NICE): [nice.org.uk/guidance/cg139/chapter/introduction](https://www.nice.org.uk/guidance/cg139/chapter/introduction)

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Ambulatory Surgery provides a multidisciplinary international forum for all health professionals involved in day care surgery. The editors welcome reviews, articles, case reports, short communications and letters relating to the practice and management of ambulatory surgery.

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Mark Skues

Email: mskues@gmail.com

Madhu Ahuja

Email: madhuahuja@nhs.net