

Safety in Day Case Surgery for Multiple or Long Aesthetic Surgery Procedures

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Abstract:

Summary:

Day surgery facilities are increasingly being used for cosmetic plastic surgery cases in the UK. In our day surgery hospital, we generally limit patients undergoing surgery to level I-II surgery, an ASA grade of I or II, an operative duration of 3 hours or less, a CAPRINI score of 5 or less, those with a predicted blood loss of 500ml or less, BMI of 32 or lower and those who are able to go home with a competent adult. Patients that fall outside these criteria are discussed in a multidisciplinary meeting before being listed for surgery. We studied those patients who fell outside these criteria and those undergoing multiple different cosmetic surgery procedures during the same general anaesthetic. We performed 1820 operations over a three year period, we studied 111 that were booked for 3 hours or more, 75 patients underwent multiple cosmetic procedures. One patient from the study group and one from the control required a blood transfusion post operatively. One patient from the control group had persistent tachycardia post operatively and was transferred to an NHS hospital. Complication rates and readmission rates were low when limiting cases to safe criteria and discussing outlying cases with theatre and anaesthetic staff. We conclude that by performing surgery within a robust system of clinical governance such as the one we adopt, cosmetic surgery performed in a day surgery facility can be safe.

Keywords: cosmetic surgery; day surgery; safety in surgery; caprini score; level of surgery; estimated blood loss; asa grade; bmi; clinical governance.

Introduction:

An increasing number of plastic surgeons in the UK are building and developing their own cosmetic surgery facilities. However, there is no definition of what can be performed safely as a day case procedure in aesthetic surgery. Day surgery institutions exist throughout the UK and some facilities offer procedures under local anaesthetic with sedation and some under general anaesthetic, depending on licensing. In this paper we aim to explore what is safely possible to perform under general anaesthetic as a day case procedure in aesthetic surgery.

Definitions of surgical complexity:

Morbidity significantly increases after 3.13 hour operating time with the exception of facelifts [1]. A recent ISAPS (international society of aesthetic plastic surgeons) document considered the effects of major surgery on morbidity [2]. and concluded that elective aesthetic plastic surgery could be considered as safe in most cases, due to an overall low morbidity/mortality of the patients, short duration of surgery and Level I-II surgical complexity in most cases (Table 1) [3]. Other factors that contribute to safety in day surgery include the ASA grade of the patient (Table 2), CAPRINI score (Table 3), those with a predicted blood loss of 500ml or less, and BMI.

Our day surgery unit started treating patients approximately three years ago and we used clinical criteria to limit the complexity of cases going to theatre. We limited patients to three hours' operating, ASA I-II, Caprini score up to 5, BMI up to 32, estimated blood loss 500ml, level 1-2 surgery and patients with a responsible adult to take them home. Any patient falling outside of these criteria was discussed in a multidisciplinary setting with the anaesthetic staff and theatre staff to determine their suitability for undergoing surgery in a facility limited in resources.

Most aesthetic procedures are single operations on one body area

on otherwise medically well patients. In some cases, however, patients wish to undergo more complex procedures in one sitting, involving more than one operation, and it would have been feasible to split the procedures into two separate operations, if it were considered unsafe to perform the cases together as a single operative procedure. For cost reasons or convenience, patients will often choose to undergo multiple procedures in one general anaesthetic, thereby potentially increasing the risk of complication and recovery. By implication, those patients undergoing multiple procedures are potentially at risk of crossing a three-hour threshold of safety with prolonged operating times.

Level I	Minimal risk to the patient independent of anaesthesia
	Minimally invasive procedures with little or no blood loss
	Often done in an office setting with the operating room principally for anaesthesia and monitoring includes: breast biopsy, removal of minor skin or subcutaneous lesions, myringotomy tubes, hysteroscopy, cystoscopy, fiberoptic bronchoscopy
Level II	Minimal to moderately invasive procedure
	Blood loss less than 500 cc
	Mild risk to patient independent of anaesthesia includes: diagnostic laparoscopy, dilatation, and curettage, fallopian tubal ligation, arthroscopy, inguinal hernia repair, laparoscopic lysis of adhesions, tonsillectomy/adenoidectomy, umbilical hernia repair, septoplasty/rhinoplasty, percutaneous lung biopsy, superficial aesthetic procedures
Level III	Moderate to significantly invasive procedure
	Blood loss potential 500–1500 cc
	Moderate risk to patient independent of anaesthesia includes: hysterectomy, myomectomy, cholecystectomy, laminectomy, hip/knee replacement, major laparoscopic procedures, resection/reconstructive surgery of the digestive tract excludes: open thoracic or intracranial procedure
Level IV	Highly invasive procedure
	Blood loss greater than 1500 cc
	Major risk to patient independent of anaesthesia includes: major orthopaedic spinal reconstruction, major reconstruction of the gastrointestinal tract, major vascular repair without postoperative ICU stay
Level V	Highly invasive procedure
	Blood loss greater than 1500 cc
	Critical risk to patient independent of anaesthesia

	Usual postoperative ICU stay with invasive monitoring includes: cardiothoracic procedure, intracranial procedure, major procedure on the oropharynx, major vascular skeletal, neurologic repair
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Table 1: Levels of surgery

ASA I	A normal healthy patient. Healthy, non-smoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease. Mild diseases only without substantive functional limitations. Examples include (but not limited to) current smoker, social alcohol drinker, pregnancy, obesity (30 < BMI < 40), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease. Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to) poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stent
ASA IV	A patient with severe systemic disease that is a constant threat to life.
ASA V	A moribund patient who is not expected to survive with the operation.
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes.

Table 2: ASA grades

1 point each

- Age 41-60
- BMI>25
- Oral contraceptives or hormone replacement therapy
- Minor surgery planned (45 minutes or less)
- History of major surgery within the past 1 month
- Varicose veins
- History of inflammatory bowel disease
- Swollen legs currently
- Acute myocardial infarction
- Congestive cardiac failure (<1 month)
- Sepsis (< 1 month)
- Serious lung disease including pneumonia (<1 month)
- Abnormal pulmonary function (COPD)
- Medical patient currently resting in bed
- Pregnant or post partum (<1 month)
- History of unexplained stillborn infant, recurrent spontaneous miscarriage, premature birth with toxemia, or growth-restricted infant

3 points each

- Age over 75
- History of DVT/PE
Family history of thrombosis*
- Heparin induced
thrombocytopenia
- Elevated serum
homocysteine
- Positive lupus
anticoagulant
- Positive Factor V
Leiden
- Positive Prothrombin
20120A
- Elevated
anticardiolipin antibody
- Other congenital of
acquired thrombophilia
- *Most commonly
missed risk factor

<p>2 points each</p> <ul style="list-style-type: none"> • Age 60-64 • Major surgery (>45 minutes) • Malignancy (present or previous, exc BCC) • Laparoscopic surgery (>45 minutes) • Patient will be or has been confined to bed for >72 hours • Arthroscopic surgery • Immobilising plaster cast (<1 month) • Central venous access 	<p>5 points each</p> <ul style="list-style-type: none"> • Elective major lower extremity arthroplasty • Hip, pelvis or leg fracture within 1 month • Stroke within 1 month • Multiple trauma within 1 month • Acute spinal cord injury within 1 month
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Table 3: Caprini Score

Aim of the study:

This paper is an analysis of a single cosmetic surgery hospital experience in performing multiple or long procedures on patients as a day case, with an emphasis on considering safety issues for such cases.

Study setting:

The study setting was a cosmetic surgery clinic, based in Glasgow, UK, in a small hospital licensed for general anaesthetic procedures, where the licensed opening hours were until 10pm.

Methods:

We analysed data from the hospital electronic patient record system. We looked at all cases performed through the day surgery hospital. We analysed operating time booked for surgery, types of surgery, surgeon performing the procedure, multiple or single procedures that were booked for the same procedure, and complications.

Data was taken from the electronic patient records. Surgical cases over a three-year period between 1st August 2020 and 31st July 2023 were analysed. In those cases that were booked for three hours or more, and where a patient was booked for multiple procedures, a more detailed analysis was performed of the patient records including complications, the actual operating time and the discharge time.

Results:

Over a three-year period, the number of surgical cases performed was 1820. All operations were cosmetic surgery cases. All were performed as day surgery cases in a day surgery facility. All patients were graded ASA I or II, had a predicted blood loss of 500ml or less, had a BMI of 32 or less and a Caprini score up to 5. Some patients, however, were listed for surgery longer than three hours, and some patients underwent multiple procedures. Very high risk patients, with an ASA grade of III or more, and high Caprini scores were simply not treated in view of the absolute risks associated with complex and significant co-morbidities.

The average operating time for all cases was 1:21hrs ranging from 15 minutes to 4 hours. The breakdown of booking times is listed in Table 4. The study group was the group of patients where operative times were greater than three hours or where patients had multiple operative procedures under one general anaesthetic, since patients outside the other criteria were not operated on. The control group was the patient group that had a single operative procedure and the procedure was booked for 3 hours or less. 1709 patients were booked for up to 3 hours, 111 patients were booked for longer. 1745 patients underwent a single operative procedure and 75 patients had multiple procedures.

One patient each in both the control group and the study group required a blood transfusion. In the study group, one patient who underwent abdominoplasty, liposuction and mastopexy bruised excessively and significantly and required a blood transfusion in a

separate facility licensed to give transfusions. She was seen post operatively a week after surgery for a routine review and reported fatigue and showed signs of pallor. A blood count showed her Haemoglobin dropped from 120g/L to 70g/L and she was referred immediately to her local medical department for transfusion. This patient was also one of the 111 patients who was booked in for surgery lasting three hours or longer. One patient in the control group underwent a blood transfusion following a delayed and persistent epistaxis post rhinoplasty, resistant to packing, and was transferred to the NHS.

One patient in the control group was transferred to an NHS hospital for a persistent tachycardia unrelated to any surgical complication. Accordingly, two patients in the control group were transferred to the NHS for complications (tachycardia, blood transfusion), and one patient in the study group was transferred to the NHS for a blood transfusion one week post operatively. All other complications and returns to theatre were managed in the day surgery hospital including two patients out of nine facelifts and blepharoplasties that suffered a haematoma requiring surgery. No other returns to theatre were noted.

For our 75 patients who underwent multiple procedures, we saw two facial haematomas. Both presented shortly after surgery.

Number of cases	hours booked
<1 hour	259
1-2 hours	1085
2-3 hours	365
3-4 hours	109
4 hours	2

Table 4: operation cases and hours booked.

Appointment Type	Total
Abdominoplasty - with Liposuction	10
Abdominoplasty - Fleur de Lys	4
Abdominoplasty	11
Breast Augmentation - Implant Exchange	2
Breast Augmentation with mastopexy	21

Breast Reduction	35
Mastectomy, Bilateral, with Nipple Graft	3
Mastopexy	18
Removal of Prosthesis from Breast	1
Revision Surgery (not specified)	4
Rhinoplasty (GA / Sed - DC - GDSC)	2

Table 5: cases booked for more than 3 hours.

Abdominoplasty with		
	augmentation mastopexy	3
	breast augmentation	2
	breast reduction	1
	liposuction	4
	mastopexy	1
	liposuction and breast augmentation	1
	mastopexy and liposuction	1
Augmentation mastopexy with		
	fat transfers to face	1
Blepharoplasty with		
	fat transfers to face	5
	brow lift	1
	inverted nipple repair	1
	CO2 laser resurfacing	5
	lip lift	1

	fat transfers to face and CO2 laser resurfacing	1
Breast augmentation with		
	nipple surgery	5
	liposuction	4
	mole removal	1
Breast reduction with		
	liposuction	4
	rhinoplasty	1
Facelift with		
	Blepharoplasties	9
	Fat transfers	1
	Liposuction	3
	Neck lift and liposuction	1
	blepharoplasties and liposuction	2
	blepharoplasties and fat transfers	1
	rhinoplasty and otoplasty	1
	rhinoplasty and neck lift	1
	fat transfers to face and CO2 laser resurfacing	1
Rhinoplasty with		
	augmentation mastopexy	2
	Blepharoplasties	3
	breast augmentation	1

	liposuction	1
	otoplasty	2
	mole removal	1
Others		
	Fat transfers to face and laser resurfacing of face	1
	labiaplasty and liposuction	1

Table 6: case mix for multiple operative procedures

Discussion:

We believe day case surgery in selected cases for aesthetic surgery is safe, in selected cases. Our day surgery hospital requires patients meet certain criteria for surgery including a Caprini score up to 5, a body mass index of 32 or less, estimated blood loss less than 500ml and any cases that are booked for more than three hours are discussed with the theatre team and anaesthetist. Any patients that have co-morbidities that might have an impact on their day to day activities are discussed with the same multidisciplinary team, to ensure we only operate on patients graded as ASA I or ASA II.

Three patients in total were transferred to the NHS for ongoing care following surgery. There were two in the control group and one in the study group. This represents a very low percentage (3/1820, 0.16%) and is one that is arguably acceptable for cosmetic surgery. This figure compares well with published data in which 7/5316 (0.13%) patients required inpatient transfer following their procedure secondary to arrhythmias, angina, and pulmonary emboli [4]. Day surgery cosmetic surgery facilities should be prepared for around 1 in 600 cases being transferred out for ongoing medical intervention that is greater than the facility is able to provide.

To deliver high-quality day surgery service our clinic adopts collaborative and protocolised pathways in pre-operative assessment, peri-operative management and post-operative care. To facilitate this, we operate within a robust clinical governance system empowered by clinical and management colleagues which is empowered by electronic incident reporting and regular follow-up database analysis of outcomes. The hospital uses a tracking system (ISOtracker) for incident reporting and all patients who deviate from the expected clinical pathway have an incident report entered. Hospital staff simply scan in a QR code to enter data which is followed up by clinical investigation. The hospital has an ISO9001 rating, and we have robust clinical protocols in place. Where a patient deviates away from the expected clinical pathway, an immediate investigation takes place with the findings presented at a clinical governance meeting.

Pre-operative assessment and preparation of patients occurs by means of a comprehensive Medical History Questionnaire prior to

a face assessment undertaken by nurses who are part of the day surgery team to ensure that the patient is appropriately prepared for their day surgery journey. ECGs and blood tests are rarely required prior for level I-II aesthetic surgery, with an ASA grade of I or II. This allows us to screen patients who may have exceptions, such as arterial hypertension, atrial fibrillation or HbA1c in diabetic patients if no result for 3 months. In cases where such tests are required, we have dedicated procedure specific protocols with oversight provided by consultant anaesthetists supporting decision making throughout the pre-assessment process. Scoring systems such as the ASA grade and Caprini Score aid risk stratification but are also readily understood by patients which aids their comprehension of risk and the interventions to mitigate this in the peri-operative phase.

We use the Caprini score, a validated risk assessment tool for VTE, to determine each patient's perioperative prophylaxis regimen. The individualised score dictates patients at low risk of VTE (Caprini 1 to 2) receive either mechanical (compression stockings and intermittent pneumatic leg compression) or pharmacological prophylaxis. Patients at moderate risk (Caprini 3 to 4) may receive mechanical and pharmacological prophylaxis. High (Caprini >5) risk patients are generally not considered for surgery at our facility. Patients who fall outside our safety criteria are stratified into a separate risk category for discussion among the theatre team as seems to be acceptable practice [5]. BMI stratification is important both for cosmetic surgery outcomes and for day surgery outcomes [6].

Intraoperative anaesthesia and/or sedation is optimised using short-acting anaesthetic techniques, commonly total intravenous anaesthesia (TIVA) with propofol or the short acting volatile anaesthetic agent Sevoflurane. Routine and combined anti-emetic therapy alongside avoidance of agents likely to contribute to postoperative nausea and vomiting (PONV) such as nitrous oxide or long-acting opioids (morphine), promoting early mobilisation and oral intake. PONV is both unpleasant and distressing for the patient but ultimately delays discharge, negatively impacting theatre efficiency and overall patient experience [7].

Immediately after leaving the operating theatre. 1:1 nursing care is provided in the primary recovery room until a patient is fully awake with any airway adjunct removed and any immediate symptoms of pain or nausea are optimised. There is no minimum specified time duration for primary recovery enabling patients to be transferred to the secondary recovery area within minutes of regaining consciousness. Our model utilises nurses trained in nurse-led discharge for day surgery as guided by discharge criteria which include:

- Pain controlled with oral analgesia.
- Nausea and vomiting controlled (or acceptable for transfer home).
- Patient tolerates oral fluids.
- Patient can mobilise safely.
- Patient has stable observations.

Discharge from our facility is supported by patient follow up and regular audit to ensure the delivery of high-quality patient care and

as a driver for quality improvement. 24/7 telephone access to trained clinical staff supports patients through their post-operative journey and patient feedback highlights its importance.

Conclusion:

In conclusion, we believe that a robust system of safety is required to ensure that patients undergoing multiple or long cosmetic surgery procedures are not placed under unnecessary risk. Our data supports the ability to perform multiple or long cosmetic surgery under general anaesthetic within our safety parameters. Engaged staff, multidisciplinary meetings and robust systems to investigate and manage deviations away from protocols are all crucial for safe day case cosmetic surgery.

Conflict of Interests:

Taimur Shoaib is a plastic surgeon and owner of the Glasgow Day Surgery Centre. Chris Lochrin is one of the senior anaesthetists engaged to provide clinical support to the hospital.

Ethical Approval:

Ethical approval – none required.

Funding: none

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