

Minor Surgery, Major Problems: A Review

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Abstract

Purpose: To examine the outcomes of common minor surgery procedures and review the ambulatory surgery literature to identify preventive measures in their occurrence

Method: Closed claims from a malpractice insurance company related to minor surgical procedures were reviewed and the more common procedures were identified and their occurrence, outcome, and preventive steps were reviewed. This information and several illustrative case studies are described.

Keywords: Minor surgery, complications, prevention.

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Conclusions: Despite the perceived “minor” nature of some surgical procedures, significant problems may ensue. In most cases, such problems can be minimized, and often prevented, with improvement of safety culture and staff readiness to accept recommended changes, involving proper informed consent documentation, surgical checklist compliance, attention to surgical technique, and increased awareness of the potential for significant complications.

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Minor surgery: surgery involving little risk to the life of the patient, specifically performed upon the superficial structures of the body or a manipulative procedure that does not involve a serious risk

(*Merriam-Webster Dictionary*).

Introduction

There is currently no generally accepted or agreed upon definition of what constitutes a minor surgical procedure, multiple sources classifying it by either a brief period of time, no need for hospitalization, being of an elective nature, under local anesthesia, or not normally constituting a hazard to life, organ function, or body parts, usually performed by a board certified surgeon in a secondary care hospital setting (1).

Despite this issue, the term minor surgery, has become well established in medical practice, surgical publications, and medical education, the adequacy of surgical residency training being evaluated based upon sufficient completion of major and minor surgical procedures (2).

While minor surgery has thus historically been viewed as a procedure that does not present a risk of significant injury to the patient during its performance, this perspective may not be entirely accurate, since interventions classically viewed as being “minor” in nature, have been associated with some very major problems.

Minor surgery can be performed in various patient care settings, each of which have different processes, resources, and requirements in the delivery of surgical care. All however, have the commonality of avoiding preventable significant complications.

For prevention of complications from minor surgery, appropriate patient selection and careful preparation for the planned minor surgical procedure are critically important in providing a safe and high level quality perioperative experience. This goal entails the performance of a complete preoperative patient evaluation that includes elements of the Surgical Safety Check List, discussed below. In the ambulatory surgery center setting, policies should be developed that address the criteria used to determine which patients may receive services there, such as use of the American Society of Anesthesia Physical Classification (ASA PC) System Score.

In that regard, the Joint Commission (JC) has established standards for ambulatory surgery centers designed to enable a clinical care facility to ascertain which medical staff members should receive new or maintenance of existing privileges and to ensure the presence of patient safety and team work.

Unfortunately, these standards are not universally adopted or implemented. In a review of 1365 ambulatory surgery centers using these criteria, the Accreditation Association of Ambulatory Health Care found a 30% failure rate for facility performance of the required periodic recredentialing and time limited granting of privileges, and a 12% failure to utilize peer review results as part of the process for granting continuation of clinical privileges (3).

Informed Consent

The traditional approach to obtaining consent for surgical procedures has evolved from a simple signature by the patient on a form. It is now generally accepted that patients should be

treated as members of the care team, and be adequately informed as to the extent and associated complications of the proposed procedure, in order to ensure their engagement and partnership in the process.

With respect to the obtaining of informed consent through intermediaries, it has been reported that physician delegation of the informed consent process to a health care provider intermediary is not the standard of care, setting the stage for additional malpractice litigation.

Namely, the Pennsylvania Supreme Court has declared that “a physician may not fulfill through an intermediary the duty to provide sufficient information to obtain a patient’s informed consent” (4). This decision could result in a major adverse effect upon the physician who delegates the informed consent process for the performance of minor surgery procedures to other healthcare providers

Wrong Site Surgery

Wrong site surgery has been found by the JC to be one of the most frequently reported sentinel events (5). Other sources estimate that this occurs as often as 40 times per week (6). This problem often results in malpractice claims, generating awards to plaintiffs in up to 79% of wrong site ophthalmologic and 84% of orthopedic surgery procedures (7).

In 2004, the JC established the Universal Protocol (UP), designed to ensure that the correct surgical procedure would be performed on

the proper patient and the proper body part (8). This process entailed the following steps; preprocedure verification, surgical site marking, and a timeout immediately preoperatively.

Unfortunately, utilization of this procedure has not eradicated the problem of wrong site surgery, which continues to happen, as noted in a 2007 report of multiple wrong-side errors occurring despite time-out processes that were described as being performed without any apparent inadequacies (9). The authors concluded that a single time-out just before the incision did not provide the necessary redundant checks.

Accordingly, in 2008, the World Health Organization proposed a Surgical Safety Checklist (SSC) protocol, modelled after the very successful one used in the aviation industry, which was expected to markedly reduce the incidence of wrong site surgery. Its main elements included three time out checks (time points) to be conducted before induction of anesthesia, immediately prior to the skin incision, and at the sign out before the patient leaves the operating room (10).

During the first sign in timepoint, the nurse and anesthesia staff verify the patient's identity, operative site, operative procedure, presence of an appropriately executed informed consent form, and that the operative site has been marked, ideally with a surgical skin marking pen, or another type of agent resistant to preoperative skin preparation.

Parenthetically, this can be an important issue, since skin markings made by conventional marking pens may fade or disappear after ethanol or chlorhexidine scrubbing. It has been reported that the notations placed by nine different types of marking pens tested were erased by preoperative scrubbing and showering. The only effective agent was henna paste, which lasted up to three weeks, despite showering and skin cleansing (11).

At the second step, the time out immediately prior to skin incision, the entire OR team confirms that all members have been introduced to the patient by name and role. The OR team also confirms the patient's identity, surgical site and procedure, and that all preoperative films have been reviewed. During the third step, the sign out time point, the OR nurse reviews with the OR team the name of the procedure, completion of correct counts and specimen identification.

Unfortunately, utilization of this process has not been very effective in preventing wrong site minor surgery. In a survey of ENT surgeons, 21 cases of wrong side sinus surgery were reported, and the UP/SSC was followed in only 1/3. Only 49% of the responding members reported routinely using a preoperative checklist, and only 65% routinely reviewed the CT preoperatively (12).

A review by the Veterans Health Administration in 2009 reported 161 adverse wrong site minor events from 908,774 procedures over a 5½ year period (.01%). Wrong implant placement for ophthalmologic and invasive radiology procedures were most commonly involved (13).

In a two year review of pain management procedures from four academic and three military centers, and three private practices involving 48,941 procedures, there were 13 cases involving transforaminal injections; 11 wrong side and 2 wrong level (14).

The question then arises, what is being done wrong? One explanation is that successful prevention of wrong site surgery using the UP/SSC is predicated on proper behavior, which is necessary in order to prevent the three basic types of human error: a) skill based, b) rule based, and c) knowledge based (15).

A skill based error is one that occurs during the performance of a routine task, usually as a result of distraction, such as an unexpected change in patient condition or a busy OR schedule.

A rule based error is one committed when shortcuts are taken, not in compliance with proper checklist completion. This can be a very common problem, as noted in a review of 671 patients, one year after checklist implementation, showing only 85% compliance with completion of the checklist and an accuracy of 64%. The authors concluded that there is a major problem in checklist compliance such that even when it is implemented, it is not reflective of completeness and accuracy (16).

A knowledge based error results when one exercises improper problem solving to deal with new situations, such as when missing or wrong equipment is an issue.

Even when 100% compliance is claimed, a report reviewing 142 wrong site minor surgical cases, including skin or soft tissue, head and neck, and ophthalmologic, found that none of the patients' checklists had been completely executed, and the average number of checklist items performed in the observed cases was only 4 of 13 (17).

The authors concluded that these data showed that despite the 100% documented completion of the preincision phase of the checklist, most of the individual checkpoints were either not executed as designed, or not executed at all. These findings demonstrate lack of checklist implementation fidelity, which may be a reflection of poor implementation and dissemination strategy.

How can these poor results be explained? In the aviation industry, timing of checklist completion arranged so that it does not interfere with other essential flight activities, does not impose significant additional workload, and is actually perceived by the aircrew as something that makes the flight easier and safer.

In the medical application, the sign in and time out time points are performed immediately before the case can begin, delaying its start, and accordingly, is often seen as an unnecessary increase in workload.

In combination with implementation issues, this may explain the continuing occurrence of wrong site surgery, as well as the reported skeptical opinions about the mandated use of checklists in surgery.

In that regard, it has been suggested that progress in this area has been slowed by excessive focusing on human error rather than adopting methodology used in other areas. These include routine automated tracking of patient safety events rather than spontaneous reporting, increasing funding for research into how care is delivered, and implementation of preventive measures, such as algorithms to identify patients at increased risk (18).

Illustrative Case

A 36-year-old woman was found to have a right palmar ganglion, for which surgical excision was recommended. On that same day, a surgical scheduler preadmission testing form was completed by the office secretary, mistakenly indicating that the patient was being scheduled for right carpal tunnel release.

On the day of surgery, the perioperative nursing record recorded that the patient's preoperative diagnosis was right carpal tunnel syndrome, and the patient had signed a consent form for right carpal tunnel release surgery. The surgeon signed the consent form, which had acknowledged that the procedure had been explained to the patient and her family and all questions had been answered satisfactorily.

The patient was taken to the OR where after a timeout was held, an endoscopic right carpal tunnel release was performed. At the second postoperative visit when the surgical dressing was removed, it became apparent to the patient that her ganglion had not been removed. When the patient questioned why the ganglion was still there and had not been removed, the surgeon responded that he had performed the procedure to which she had consented.

In this case, there was a question regarding a language barrier such that when the office secretary asked the patient if she were having carpal tunnel surgery, the patient replied in the affirmative which was also the case in the preoperative area in the surgical consent form for right carpal tunnel release being signed by the patient. Analysis of the case revealed that all three failures of proper behavior had occurred.

In a similar case performed at another facility, a patient consenting to a trigger finger release underwent a carpal tunnel decompression instead, despite preoperative discussions and apparent compliance with the surgical safety checklist having been carried out by the OR staff and the surgeon, who expressed his opinion that after this incident, he “no longer saw these protocols as a burden” (19).

This observation, however, clearly reflects that the surgeon indeed had viewed the protocols as unacceptably onerous, and this attitude can be a major problem in their implementation and attempts to prevent wrong site/patient surgery.

Retained surgical items (RSI)

Unintended retention of a foreign body was the fourth most common sentinel event reported to the JC, with 94 occurrences in 2021, and 30 events in the second quarter of 2022, involving surgical sponges and laparotomy pads, cotton applicator tips, parts of surgical instruments, catheters, and localization wires, occurring in multiple specialty settings, felt to represent a human error due to poor policy, suboptimal safety culture, and inadequate communication (20).

Variations in the clinical practices of counting, use of count visualization tools, and time-out procedures also increase the possibility of an RSI. The risk of a retained item unfortunately continues to exist even when counting of sponges, sharps, and instruments is performed for every surgical procedure in the OR (21).

Implantation of pacemakers or generous flap undermining may result in capacious subcutaneous pockets into which small sponges can be placed and retained. Good surgical practice mandates that sponges are counted on all procedures in which the possibility, not probability, exists that a sponge could be retained.

Implemented use of an all-encompassing bundle of best practices, instead of a single-component intervention, can be more effective in reducing preventable human errors that result in the occurrence of a RSI. Use of this bundle technique has been reported to result in a 14.3% reduction in the rate of harm, a 59.1% increase in near miss reporting of retained objects, and a compliance rate of 70.5%, resulting in improved reliability and near miss reporting, while also improving the quality of care for patients (21).

This practice entails the incorporation of five elements: Surgical Stop (initiated by the surgeon prior to the first stitch of closure with all activity ceased while the surgeon performs an exploration of the surgical wound), Surgical Debrief (counts are verified prior to the surgeon leaving the room), Visual Counter (whiteboard used to track surgical items throughout the procedure), Imaging (to be utilized prior to closure when counts are incorrect), and Reporting (deviations such as incorrect surgical counts without resolution).

Syncope

Several risk factors have been associated with the development of a vasovagal reaction secondary to minor surgical procedures, the most important being a prior history of such reactions. Loss of consciousness secondary to vasovagal reactions in association with surgical procedures under local anesthesia has been reported to develop in 14% of patients, and may be associated with injuries in up to 30%, usually consisting of bruising, abrasion, or laceration. However, in 4% of patients, injuries were severe, involving fractures, burns, joint pain and dental problems (23). These may result in malpractice claims with significant outcomes.

In one instance, a patient was allowed to stand unattended postoperatively, despite feeling dizzy, and fell, sustaining injuries for which a malpractice court awarded 1.2 million dollars (24).

Preventive measures have been suggested to minimize preoperatively the occurrence of this complication by encouraging fluid intake and temporarily discontinuing medicines that lower blood pressure, as well as ensuring patients are monitored postoperatively for signs of increased vagal tone and avoiding triggers, such as unsupervised standing.

Tissue fillers

Tissue filler injections, usually involving hyaluronic acid and calcium hydroxylapatite preparations, are very commonly administered for cosmetic enhancement. Due to the rich vasculature of the commonly injected head and neck region, the use of such tissue fillers may be complicated by intraarterial injection. The viscous nature of these preparations may result in arterial inflow compromise which can rapidly cause significant tissue ischemia progressing to necrosis, requiring multiple surgical debridements (25).

Illustrative Case

A 39 year old nurse practitioner presented to a cosmetic surgeon requesting augmentation of her nasolabial folds. The patient signed a multiple page informed consent form listing multiple potential complications of calcium hydroxylapatite (Radiesse, Merz North America Inc. Franksville, WI), an injectable tissue filler). However, there was no mention that its adverse effects could not be rapidly reversed by the injection of hyaluronidase, as can be done for hyaluronic acid based fillers such as Juvederm (Allergan Aesthetics) or Restylane (Galderma, Lausanne). Radiesse 0.8ccs was injected into the left nasolabial fold using a 27 gauge needle. Shortly after the injection, the patient complained of numbness, swelling, and discoloration of the area which eventually progressed to areas of significant necrosis, requiring multiple debridements, with resultant deformity and scarring. It was felt that the Radiesse had been injected into the left angular and/or the dorsal and lateral nasal arteries, resulting in vascular occlusion and ischemic necrosis.

In some cases, tissue fillers injected into the facial vasculature may embolize into the ophthalmic artery, resulting in blindness, especially if the injection is rapidly injected and/or near to underlying vasculature (26).

Spinal Accessory Nerve Injury

The spinal accessory nerve lies very superficially in the posterior cervical triangle, where it is vulnerable to injury from procedures such as lymph node biopsy. In our review of closed claims there were 21 instances of this problem. None of the informed consent discussions/forms included mention of this complication, the diagnosis was delayed in all patients postoperatively, and significant permanent disability was present in a high percentage of patients.

Common causes described were blind electrocoagulation of bleeders, suture ligatures, and lack of nerve stimulator usage. This can be a serious injury, since the spinal accessory nerve innervates the trapezius muscle, which function is critical to stabilizing the scapula to allow lateral elevation of the humerus. Without trapezius contraction, the scapula “wings” posteriorly, and patients are unable to achieve full abduction of the shoulder.

Conclusion

Despite the perceived “minor” nature of some surgical procedures, significant problems may ensue. In most cases, such problems can be minimized, and often prevented, with improvement of safety culture and staff readiness to accept recommended changes, involving proper informed consent documentation, surgical checklist compliance, attention to surgical technique, and increased awareness of the potential for significant complications.

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