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Case Series

Being a scalpel holder might make you its victim; a series of 4 cases

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ABSTRACT

Introduction: Scalpel blades and suture needles are the two most perilous nonhollow-bore gadgets causing percutaneous injuries in hospitals. The prevalence of these injuries and type of injuries in the Kurdistan federal region is not known.
Patients and methods: a retrospective, multicenter study, enrolling four medical personnel suffering from significant blade injuries necessitating surgical intervention.
Results: This study reports a series of four cases who had critical injuries caused by surgical blades. These injuries occurred in the femoral artery, radial artery, index figure and thumb. Surgical intervention was performed under general anesthesia in three cases and under local anesthesia in one case. The injuries left long term sequelae in two cases.
Conclusion: Accidental scalpel injury is a continuous and neglected threat to health care staffs especially surgeons and could be tragic and both time consuming and financially exhausting. Elucidating the circumstances and risk factors resulting in such injuries is important in order to develop preventive guidelines and to increase awareness about this relatively hidden yet tragic event.

1. Introduction

Suture needles and scalpel blades are the two most perilous nonhollow-bore gadgets causing percutaneous injuries in hospitals [1]. On average, scalpel blades are likely to engender severer injuries than suture needles [1]. The complex environment of the operative setting imperils health care workers to sustain scalpel injuries [2]. The most insecure site for such an injury is the left index finger of the blade holders [3]. The sequelae of scalpel injuries are time consuming, emotionally fraught, and potentially expensive, because the injured person may require prophylaxis against blood-borne diseases, psychological support, and injury rehabilitation [2]. This event usually affect residents or attending surgeons, especially the former with few years of training, who may be the most active in performing surgery [4]. The aim of this study is to report scalpel injuries to medical personnel with different level of training that resulted in severe injuries necessitating surgical intervention in Kurdistan federal region. The work has been processed in line with PROCESS guideline [6].

2. Case series

2.1. The first case

A 28-year-old female cardiothoracic surgery fellow sustained a penetrating injury to her left index figure by a blade 11 scalpel. Towards the end of thoracoscopic surgery a tube thoracostomy is usually placed into the port of the thoracosope. The tube thoracostomy available had a plastic connector which had to be disconnected in order for the tube to pass through the port. In

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trying to disconnect the connector, which in this case was stuck, the female surgeon used the 11 blade scalpel when the blade slipped and penetrated her left index finger. She reported severe pain with bleeding from the site of injury controlled by pressure, with immediate loss of flexion and sensation in the lateral part of the index finger. On examination, there was through and through injury to the left index finger in zone II (Fig. 1) with loss of flexion in the territory of flexor digitorum superficialis and profundus associated with loss of sensation in the lateral aspect of the finger. Within 6 hours, the patient was transferred to the operating room and through zigzag incision exploration was conducted. Intraoperative findings showed transection of the following structures: both heads of flexor digitorum superficialis, flexor digitorum profundus, lateral digital nerve and artery, A2 and A4 pulley and volar plate. Repair of one head of the flexor digitorum superficialis, flexor digitorum profundus, digital nerve and A2 pulley was performed. Post operatively, the hand was kept in back slab with 30° flexion of the wrist and 70° flexion of the metacarpophalangeal joints for three weeks. After removal of the back slab, active physiotherapy was commenced, leading the patient to be abstained from practice for four months.

After two years follow up, the patient was back to work normally but she was suffering from severe flexion deformity of the left index finger, and reports some limitation compensated by the middle finger. She was also suffering from swelling and paresthesia following prolonged usage. Due to limited local facilities and expertise, second operation has not been done in fear of losing the present degree of flexion and performance (Fig. 2).

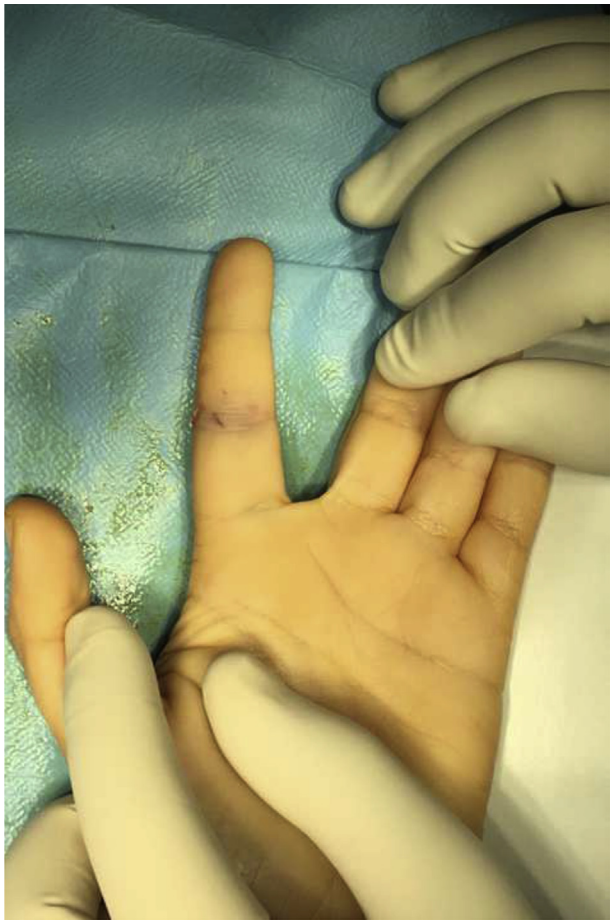

Fig. 1. The injury of the first case. Shows through and through injury to the left index in zone II.

2.2. The second case

A 38-year old male general surgeon, with 10 years experience of practice, had a penetrating injury to his left femoral artery while performing a laparoscopy. He reported absence of a scrub nurse at that time due to shortage of medical staff. While aiming to insert the third port, instead of asking for the scalpel, he took it himself from the table which led to a jerky movement resulting in the surgeon injuring himself in the right inguinal area. The patient was resuscitated and transfused by two units of whole blood. Through a right longitudinal incision along the course of the femoral artery, exploration was done and the common femoral artery found to be completely transected, the vein was spared. Repair was done by end to end anastomosis. Postoperatively, the distal pulses were positive and he had uneventful course. He was disconnected from work for nearly two weeks only. After five years follow up, the patient is doing well, no limitation of activity and no arterial insufficiency.

2.3. The third case

A 26-year old male general surgery fellow, in his first year of training, had a penetrating injury to his left thumb by a blade 24, not during surgery but while using the blade for fixing an instrument. He was holding the blade with his right hand when the blade slipped and injured the dorsal surface of his left thumb. On examination, there was a linear cut injury to the left thumb in zone TIII, the thumb was in flexion position. Within hours, the patient was transferred to the operating room, through zigzag incision exploration was executed. Intraoperative findings showed transection of both extensor halluces longus and brevis. Both were repaired. Post operatively, the hand was kept in back slab for 28 days. After removal of the back slab, active physiotherapy was started. After 30 year follow up, the patient is still suffering from some degree of limitation in thumb extension (Fig. 3).

2.4. The fourth case

A 24-year old female nurse, had a penetrating injury to her right wrist while she was disconnecting the blade from its holder. She was holding the blade holder by her left hand, directed to herself, trying to disconnect it by an artery forceps with the right hand when the blade slipped and penetrated the medial aspect of her right wrist resulting in severe pain and pulsatile bleeding. On

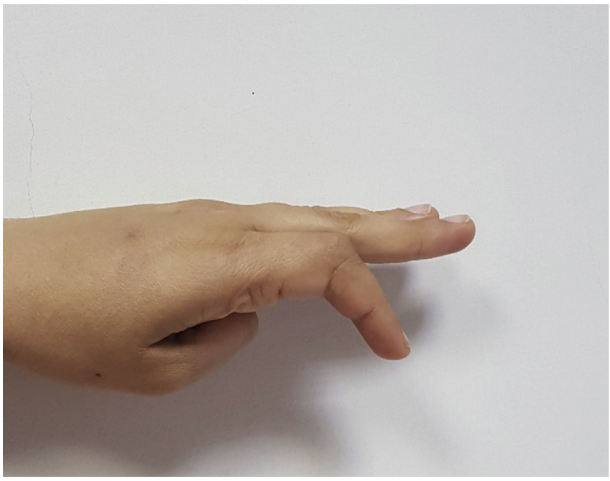

Fig. 2. Two years post injury follow up of the first case showing severe flexion deformity of the left index finger.

Fig. 3. Thirty years post injury follow up of the third case, showing mild limitation of left thumb extension.

examination, there was a linear cut to the medial aspect of the wrist resulting in total transection of the ulnar artery. Immediately, under local anesthesia the artery was ligated. After two years follow up, the patient is doing well.

3. Discussion

A surgeon's hand is her/his treasure, a self-expressing tool, a stress relieving utensil to some, like a violin strings, if one is damaged, you would expect the tragic results of the orchestra.

Being a surgical trainee means being in a continuous race with time and a sudden transform from this active life style to disconnection from work due to self-inflicted injury can have a dramatic effect. Especially for the two trainees who sustained injuries to their hands, during that period, even the simple daily tasks, including personal care activities, has transformed into challenging missions [1]. Since most of the injuries occur in the operating room, where only a fraction of injuries has been reported, their true frequency is not well recognized [1]. Scalpel injuries represent a multifaceted injury risks, because they result in mechanical injury to the operators and expose both the injured workers and the patients to the potential of contracting a blood-borne infection, such as human immunodeficiency virus (HIV) or hepatitis B or C [2].

In this series, two of the patients who sustained tendon injuries had the most extended disconnect from the work, the first case being the longest because of the nature of the injury and its notorious site, the no man's land, as it is established that the functional outcome of flexor tendon injuries in zone two carries the poorest outcome with higher rate of complication than that of other zones [5]. Following the three-week period, when the slab was removed, the patient realized that she had to face the worst nightmares which was inability to work normally again and she had to start intensive physiotherapy sessions which were both time consuming and financially exhausting. The hardest feeling a surgeon could have is to be inside the operating room while not being able to tie a node (as she described). Apart from the tendon injury, the digital nerve injury, though it was unilateral and repaired was by itself unpleasant, leading to a foreign body sensation and desire to amputate the finger in the early days after injury. This may encourage surgeons not to under estimate sensory nerves and thinking twice before deciding not to repair them.

Fortunately, in the three case (75%) who had hand injuries, it was the non-dominant hand that was involved, which is the most vulnerable one, a finding supported by the literature [3].

The other two case 50%, had an arterial injury, the femoral one was risking the surgeon life, highlighting how ignoring simple guidelines can lead to catastrophes.

Although several guidelines pertaining to the safe use of scalpels by surgeons and nurses have been developed by various professional organizations and institutions, a paucity of knowledge is available in the literature about these guidelines and significant resistance by surgeons to the use of some of these procedures and devices in the operating room setting has been reported. Reasons for this resistance include the perception that an operation is interrupted or slowed by these devices/procedures [1–4]. There was no gender difference in this report, but three of our patients (75%) had relatively few years of experience.

In the literature, needle stick and sharp injuries have been well highlighted, however to our knowledge, this is the first case series, describing severe self inflicted injuries to health care personales, necessitating surgical intervention with prolonged sequel. However this doesn't correlate with the frequency of occurrence of this event, as there is a significant ignored recorded percentage of the minor injuries as well that resulted in blood born infection acquisition in some, some of the reasons for this under reporting is studied by Hambridge et al., and might be due to in part to wrong perception of needle cleanness or infectivity, embarrassment from reporting the incident especially among young trainee or student in fear of being judged as not efficient or affecting their grades, unawareness of the importance of reporting and being busy and ignoring the incident [7].

We stand in line with some of the recommendations has been made by authors, like using blunt needles that are sharp enough for muscle and fascia but not for the percutaneous tissue of the health workers. Following the hand free technique of passing sharp instruments in a neutral zone can avoid hand collisions and lessen unnecessary injuries. Emphasizing on using dissecting forceps for separating tissues instead of forceps, using scalpels with protective shields that can be placed in protective position during passing or after use [1,8] and in case using blade is coming necessary to disconnect tubing, we advise doing that on hard surface like an instrument table, the tubal part being fixedly hold by an artery forceps and not by bare hands.

Finally, in this report, there is message to health care professionals, especially to the juniors, to always bear in mind that 1 s can change a life path, so we cannot more over emphasize for being more careful with handling sharp instruments and not to use them for what they are not designed for, a practice that unfortunately most of us do.

4. Conclusion

Accidental scalpel injury is a continuous and neglected threat to the health care staffs especially surgeons. The result could be tragic and both time consuming and financially exhausting. It is of great importance to always remind junior health care personnel about the significance of this rare yet miserable event and its effect on their career to be more conscious not only cautious in the operating room.

Ethical approval

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Author contribution

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- Substantial contribution to the concept and design.
- Drafting the manuscript.
- Final approval of the manuscript.

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- Substantial contribution to the concept and design.
- Data collection and revising the manuscript.
- Final approval of the manuscript.

Conflict of interest statement

None to be declared.

Guarantor

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Research Registration Number

Not applicable.

Consent

Written informed consent was obtained from the patients for publication of this case series and any accompanying images.

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References

[1] Jagger Janine, Balon Melanie. Suture needle and scalpel blade injuries frequent but underreported. Adv Exp Prevent 1995;1(3):1–6.
[2] Watt Amber M, Patkin Michael, Sinnott Michael J, Black Robert J, Maddern Guy J, Adelaide, et al. Scalpel safety in the operative setting:A systematic review. Surgery 2010;147(1):98–106.
[3] Hussain SA, Latif ABA, Choudhary AAAA. Risk to surgeons: a survey of accidental injuries during operations. Br J Surg 1998;75(1):314–6.
[4] Tokars Jerome I, Bell David M, Culver David H, Marcus Ruthanne, Mendelson Meryl H, Sloan Edward P, et al. Percutaneous injuries during surgical procedures. JAMA 1992;267(1). 2899-4.
[5] Momeni Arash, Grauel Emily, Chang James. Complications after flexor tendon injuries. Hand Clin 2010;26(2):179–89.
[6] Agha RA, Fowler AJ, Rammohan S, Barai I, Orgill DP, PROCESS group. The PROCESS statement: preferred reporting of case series in surgery. Int J Surg 2016;36(Pt A):319–23.
[7] Hambridge K. Needlestick and sharps injuries in the nursing student population. Nurs Stand 2011;25(27):38–45.
[8] Hussain SA, Latif ABA, Choudhary AAAA. Br J Surg 1988;75(4):31 4–31 6.