



General Surgery

ASSESSMENT PERCUTANEOUS INJURIES DURING EMERGENCY SURGICAL PROCEDURES

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ABSTRACT

In the past, percutaneous injuries and mucocutaneous exposures were considered to be an accepted occupational hazard for the surgeon. Although the potential for injury, exposure, and contraction of blood-borne disease was well known, there were no attempts to reduce risk of such events. Initially HIV and AIDS were considered to be rare and confined to particular groups at high risk. This inaccurate notion changed rapidly as the disease reached epidemic proportions, and by 1987 the CDC recommended “Universal Precautions,”¹ which state that blood and body fluid precautions be used with zaopall patients. It was at this time that the CDC made their first recommendations for use of appropriate barrier protection and against resheathing contaminated needles. This is to study the frequency of injuries with their relative cause of injury and their preventive measures to overcome for prevention. . The study was designed to be a cross sectional study which included both patients and health care professionals to assess the quality of surgical procedures and number of percutaneous injuries in particular faced by the patients. Ethical clearance was established before starting of the study. Patients who have accepted for the study followup of therapeutic outcome, and patients with percutaneous injuries have been mainly involved into the study. Patients with other complicated injuries and patients with other comorbidities, operation induced injuries other than percutaneous have been excluded from the study. From the study it can be concluded that in the study site the number of injuries were more with resident surgeon and attending surgeon related percutaneous injuries. Intestinal procedures and cardiac services related injuries are more compared to other procedure related percutaneous injuries. From this study it is clear that oversight is the main cause for occurrence of injury during the procedure and this can be minimized by following certain management guidelines that could be evaluated and established by the hospital staff.

Key words: Surgery, Percutaneous Injury, Surgical Procedure Related Problems, Health Care Professional.

INTRODUCTION

In the past, percutaneous injuries and mucocutaneous exposures were considered to be an accepted occupational hazard for the surgeon[1]. Although the potential for injury, exposure, and contraction of blood-

borne disease was well known, there were no attempts to reduce risk of such events[2]. Initially HIV and AIDS were considered to be rare and confined to particular groups at high risk[3]. This inaccurate notion changed rapidly as the

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disease reached epidemic proportions, and by 1987 the CDC recommended “Universal Precautions,”¹ which state that blood and body fluid precautions be used with zoonotic patients[4]. It was at this time that the CDC made their first recommendations for use of appropriate barrier protection and against resheathing contaminated needles[5]. In 1991 The Occupational Safety and Health Administration required use of Universal Precautions with the enactment of the Bloodborne Pathogen Standard[6]. When the human immunodeficiency virus was described in 1981 we began to pay greater attention to health care worker safety in the operating room[7]. In 1983 the Centers for Disease Control and Prevention (CDC) recommended “caution” when handling body fluids from patients suspected of having AIDS[8]. This standard has been revised and updated several times, most recently in 2001[9]. Although discovery of AIDS and HIV was the driving force behind development of Universal Precautions, it is widely appreciated that many serious illnesses can be contracted through contact with contaminated blood and body fluids[10]. Unfortunately the published literature indicates that surgeons demonstrate poor compliance with Universal Precautions[11]. Perhaps even more unfortunate is the failure of Universal Precautions and the Bloodborne Pathogen Standard to fully address the needs of the high-risk operating room environment. Injuries to surgeons and scrub personnel continue to occur[12].

The second commonest cause of occupational injury within the National Health Service (NHS) is needlestick injury[13]. This is where a person comes into contact with someone else’s body fluids either by direct inoculation by a sharp instrument, such as a blade or a needle, or by splashes of the body fluid in question to the recipient’s skin, mucous membranes or eyes [14]. The second commonest site in which such injuries are sustained is in theatre. In addition to the danger of blood-borne virus contraction by the injured person and the associated anxiety experienced by themselves and their contacts, there is also a significant cost to the organization, both financial and in terms of lost man-hours [15].

AIMS & OBJECTIVES:

- To assess the frequency of injuries during surgical procedure
- To assess the types of percutaneous injuries in operating room
- To assess and report the person related injuries in a health care hospital
- To report the frequency of injuries with their relative cause of injury and their preventive measures to overcome for prevention

METHODOLOGY:

The study was carried out in around 187 patients who have undergone surgical procedures during the study period of June 2018 and January 2019. The study was

carried out in the Andhra Pradesh, India. The study was designed to be a cross sectional study which included both patients and health care professionals to assess the quality of surgical procedures and number of percutaneous injuries in particular faced by the patients. Ethical clearance was established before starting of the study. Patients who have accepted for the study followup of therapeutic outcome, and patients with percutaneous injuries have been mainly involved into the study. Patients with other complicated injuries and patients with other comorbidities, operation induced injuries other than percutaneous have been excluded from the study.

RESULTS & DISCUSSION:

Numerous number of surgical procedures have been operated in the study site during the period of study. Various procedures that are involved in occurrence of injury and percentage of injury during the procedure were analysed. Various procedures that may be involved in injury studied in the study are use of fingers while suturing which included 94 injuries in the overall study of 187 injuries comprising for 50.2%, other suture related actions that lead to injury comprised of 38 cases with a percentage of 20.32% that may be caused during pulling through a suture in major cases, injuries in case of actions not related to suturing included 40 cases with a overall percentage of 21.3% in which passing an instrument stood as major reason. Unknown causes for percutaneous injury comprised of 15 cases accounting for 8% of study population. All the data related to reason for percutaneous injury have been enlisted in Table 1.

Recontacts can be defined usually as the contact of other organs during the surgical procedures which might or might not be the part of the procedure and which may lead to percutaneous or other type of injury within the organs of the patients. In the study, the no. of procedures performed in various department related surgical needs like cardiac service, gastrectomy, intestinal procedures. Cholecystectomy, other general surgeries, vaginal hysterectomy, abdominal hysterectomy, other gynecological, orthopedic and trauma services have been keenly assessed and reported in the study, which are represented in the Table 2. The cardiac services related injuries accounted for 34 injuries among 145 total number of procedures performed, gastrectomy included 15 injuries among 33 procedures performed, intestinal procedures accounted with 27 injuries among 161 cases, cholecystectomy resulted in 34 cases of percutaneous injury among total 143 cases, among 160 cases operated for surgery it was noted that 24 cases have faced injury during the procedure.

Vaginal hysterectomy was done in about 67 cases among which 34 cases have experienced injury during the procedure. In 198 cases of abdominal hysterectomy performed, more than 40 cases have experienced percutaneous injury. Other gynecological procedures

related injuries included 27 cases, total knee replacement related injuries included 23 cases, other orthopedic related percutaneous injuries included 27 cases among 321 cases operated, abdominal and non abdominal trauma injuries involved 29 and 22 cases respectively resulting in injury during surgical procedures.

It is also evaluated for the person related injury occurrence in the study, thus, the areas of injury occurrence and the steps to be taken to minimize the occurrence of injury can be estimated and minimized. It was found in the

study that resident surgeon related injuries accounted for about 2% of overall number of cases operated with open procedures, attending surgeon accounted for 3% of overall cases, physician's assistant made injuries were reported in 2% of cases and medical student related percutaneous injury was reported in 1% of overall cases and circulating nurse related injuries were as less as 0.5% of overall injuries in patients.

Table 1: Actions being performed at the time of percutaneous injury

Action	No. (%) of injuries (N = 187)
Use of fingers while suturing	94(50.2)
Holding tissue that was being sutured	52(27.8)
Retrieving a suture needle after suture placement	21(11.2)
Positioning a suture needle in a needle holder	16(8.5)
Replacing a suture needle in the needle counter	5(2.67)
Other suture-related actions	38(20.32)
Pulling through (tightening) a suture*	18(9.6)
Typing a suture	11(5.8)
Guiding the path of a suture needle	7(3.7)
Unspecified phases of suturing	2(1.1)
Actions not related to suturing	40(21.3)
Passing an instrument	21(11.2)
Palpating in the surgical wound	9(4.8)
Incising tissue	4(2.1)
Picking up or putting down an instrument	2(1.1)
Miscellaneous	4(2.1)
Unknown	15(8.0)

Table 2: Percutaneous injuries and recontacts by service and surgical procedures*

Service/procedure undergone	No. of procedures	No. (%) of procedures with ≥ 1 injury	No.(%) of procedures with \geq recontact
Cardiac service	145	24(23.4)	10(6.8)
Coronary artery bypass graft	112	13(11.6)	6(5.4)
Other cardiac	33	11(33.3)	4(12.1)
Gastrectomy	44	8(18.2)	2(4.5)
Intestinal procedures	161	23(14.2)	4(2.4)
Cholecystectomy	143	22(15.38)	12(17.2)
Other general surgery	160	13(8.1)	11(6.8)
Ventral herniorrhaphy			
Appendectomy	80	8(10)	9(11.25)
Miscellaneous	39	3(7.69)	3(7.69)
	71	2(2.8)	1(1.4)
Vaginal hysterectomy	67	20(29.8)	14(20.8)
Abdominal hysterectomy	198	27(13.6)	16(8.1)
Other gynecology	103	14(13.5)	13(12.6)
Ovarian cystectomy	23	11(47.8)	10(43.47)
Salpingoophorectomy	47	1(2.12)	3(6.37)
Miscellaneous	33	2(6.1)	0(0)
Orthopedic services			
Total knee replacement	46	13(28.2)	10(21.7)
Open reduction, internal	121	23(19)	10(8.26)

fixation			
Other orthopedic	321	17(5.2)	10(3.21)
Repair hip fracture	41	4(9.7)	3(7.31)
Total hip replacement	99	5(5.05)	2(2.02)
Arthrotomy	34	2(5.8)	1(2.9)
Removal of hardware	22	2(9.1)	1(4.54)
Laminectomy	67	1(1.5)	1(1.5)
Debridement	43	2(6.6)	1(2.32)
Miscellaneous	15	1(6.6)	1(6.6)
Trauma service			
Abdominal trauma	143	16(11.2)	13(9.1)
Nonabdominal trauma	54	11(20.3)	11(20.3)

Table 3: Risk of percutaneous injury by person-procedure

Job title	No. of person-procedures	No. of injuries (no. of injuries per 100 person-procedures)	No. (%) of person-procedures with ≥ 1 injury
Resident surgeon	3412	67(2.0)	60(1.75)
Attending surgeon	1763	43(2.5)	41(2.32)
Physician’s assistant	231	3(1.3)	5(2.16)
Medical student	4121	11(0.26)	6(0.14)
Circulating nurse	4762	1(0.02)	0(0)

CONCLUSION:

From the study it can be concluded that in the study site the number of injuries were more with resident surgeon and attending surgeon related percutaneous injuries. Intestinal procedures and cardiac services related injuries are more compared to other procedure related

percutaneous injuries. From this study it is clear that oversight is the main cause for occurrence of injury during the procedure and this can be minimized by following certain management guidelines that could be evaluated and established by the hospital staff.

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