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PENETRATING NECK INJURIES ;
SELECTIVE VERSUS MANDATORY EXPLORATION

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ABSTRACT

OBJECTIVES: The aim of this study is to highlight the effectiveness of selective exploratory protocol in penetrating neck injuries which may reduce the number of negative explorations without increasing the number of complications due to delay in exploration. **SETTING**: Departments of General Surgery and ENT, Mayo Hospital Lahore. **DESIGN**: Retrospective study. **PERIOD:** Jan, 1997 to Dec, 1998. **PATIENTS AND METHODS**: Fifty two patients presenting with penetrating neck injuries were included in this study; 46 male and 6 female patients. **RESULTS**: A selective exploration in penetrating neck injuries is safe management. **CONCLUSION**: The selective exploratory approach is a safe and reliable procedure in managing significant neck injuries requiring surgical intervention.

KEY WORDS: Penetrating neck trauma, Mandatory Exploration, Selective Exploration.

INTRODUCTION

The neck may be defined as the region of the body that lies between lower margin of mandible and superior nuchal line above, and suprasternal notch and upper border of clavicle below. In this region a large number of structures are compressed in a small area.

For purpose of diagnostic strategy and operative approach the neck is divided into three zones. Zone I is below a horizontal line 1cm above the claviculomanubrial junction or inferior to the cricoid cartilage. Zone II lies between zone I and angle of the mandible. Zone III lies between the angle of the mandible and base of the skull. Zone II and III are considered the neck proper, the zone I is the base of the neck or thoracic inlet.

There is a general agreement that penetrating wounds

with overt evidence of deep injuries should be operated upon urgently. A difference of opinion exists regarding the necessity of operative exploration of patients without apparent evidence of such injuries. However, selective exploratory approach has gained popularity because of lower rates of negative explorations.

PATIENTS AND METHODS

This study was carried out over a period of two years in the Emergency Departments of General Surgery and ENT, Mayo Hospital Lahore. Total number of patients were fifty two (46 male and 6 female patients). Patients presenting with penetrating neck injuries violating the platysma were included in this study.

A complete history and thorough physical examination of every patient was carried out. Routine investigations such as, complete blood and urine examination, blood sugar and X-ray chest were carried out.

After resuscitation and routine investigations some patients were selected for immediate exploration of the neck (Group A) while others were observed with constant monitoring (Group B) according to protocol based mainly on physical examination. All explorations were done under general anaesthesia. Operative wounds were closed in layers.

Patients of Group B were observed for evidence of any missed injuries and explored if required later on due to deteriorating clinical condition. These patients were discharged when it was sure that there was no missed injury to any named structure.

RESULTS

Fifty two patients presenting with penetrating neck injuries in Emergency Departments of General Surgery and ENT, were included in this study. Age ranged from 15-60 years (Table I). There were 46 male and 6 female patients, male to female ratio was 8:1(Table II).

The time interval between injury and reporting to the hospital ranged from 15 minutes to 72 hours with mean interval of 2.5 hours. The distribution of neck injuries in different zones of neck are shown in Table III. Out of 52 patients, 34 patients with obvious vascular or visceral injuries were explored, this comprised Group A.

Table I. Age distribution of patients.

Age Group	No. of patients	%age
16-30 years	10	19.23%
31-45 years	24	46.15%
46-60 years	18	34.61%

Table II. Sex Distribution of patients.
n=52

Sex of patients	No. of patients	%age
Male	46	88.4%
Female	6	11.6%

Laryngotracheal injury was the most common visceral injury found. In vascular injuries, internal jugular vein injury was the most common injury found, followed by common carotid artery. Only in one case exploration was negative.

Eighteen patients were included in Group B. Out of these, 16 were treated conservatively and discharged, while 2 were operated later on for infection and haematoma. The haematoma was evacuated and wound was packed.

The length of hospital stay was 6 to 22 days in Group A with mean stay of 10 days. In Group B the length of hospital stay was 3 to 10 days with mean stay of

4 days. Ten patients had postoperative complications. Four patients had more than one complication(Table IV).

Table III. Distribution of neck injuries in different neck zones.

n=52

Zones	Group A	Group B
Zones I	19	0
Zones II	14	11
Zones III	1	7

Table IV. Postoperative complications.

Complications	Group A	Group B
Cellulitis	02	--
Subcutaneous infection	01	01
Haematoma	01	02
Chest infection	04	01
Change of voice	02	--
Total	10	04

DISCUSSION

The management of the neck wound depends upon whether it is a superficial or deep wound. Penetrating trauma may injure blood vessels, nervous structures and upper aerodigestive tracts. There is no argument regarding the need for an emergency operation on patients with obvious signs or symptoms of major vascular or aerodigestive tract injuries.

Controversy exists about the role of surgical exploration in patients with no clinical signs of significant injuries. However it is stressed that all patients with injuries violating the platysma should be hospitalized. Some surgeons believe that all injuries that have penetrated the platysma should be explored surgically, irrespective of the signs and symptoms, whereas others support a selective conservative management.

The proponents of routine exploration suggest that physical examination is not reliable and that potentially dangerous injuries may be missed[1,2]. Most authors have not adopted this policy because of high rate of negative explorations[3].

In this study, most of the patients were young, otherwise healthy adult males. Zone II was the most commonly injured zone of the neck, probably because it is the most exposed area of the neck. Least injuries were found in Zone III.

Decision about selective versus mandatory exploration was made mainly on the basis of physical examination. All the injuries in Zone I were explored because the patients with injury to Zone I is at risk of exsanguinating haemorrhage which may be occult if blood tracks into the chest or mediastinum. There was only one negative exploration in this zone. Fifity six percent of Zone II injuries were explored and there was no negative exploration while 44% were selected for conservative management.

Most of the injuries in Zone III (87%) were managed conservatively. Wide exposure of this area and distal vascular control is difficult to obtain. Routine exploration as a diagnostic manoeuvre may be both hazardous and inaccurate.

Out of 52 patients, 5 expired due to haemorrhage and respiratory failure following cord damage. Mortality rate was 9.6% which is within the range of series reported by some authors previously[4]. Mean length of hospital stay was twice longer in Group A as compared to Group B, due to their extensive injuries. The mean cost of medicines and investigations was 2.5 times higher in Group A as compared to Group B, again due to more extensive injuries in Group A.

The previous studies conclude that a selective approach to the operative management of penetrating injuries to the neck, when guided by repeated examination, is appropriate, does not increase risk to the the patients and avoids unnecessary surgical procedures[5].

Some authors have suggested that it would be rationale to pursue mandatory exploration for gunshot wounds of neck and selective non-operative approach for stab wounds[6]. But this concept is not supported by others as routine operation for gunshot wounds have been associated with higher rate of unnecessary operations[7,8].

CONCLUSION

It is concluded from this study that all patients with penetrating neck injuries violating the platysma should be hospitalized. The selective exploratory approach, on the basis of thorough physical examination, is a safe and reliable procedure in detecting significant injuries requiring surgical intervention. All the injuries in Zone I should be explored.

However a small number of patients may be treated conservatively. Selective exploratory approach is economical as regards the cost of medicines and investigations and hospital stay.

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Genius is one percent inspiration and ninety-nine percent perspiration.

Thomas Edison