

Research Article**Assessment the Fracture of Hyoid Bone in Various Modalities of Strangulation of Neck****¹Tahreem Ubaid, ²Syed Hamid Anwer
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Quaid-e-Azam Medical College, Bahawalpur.**ABSTRACT:****Objective:**To assess the fracture of hyoid bone in various modalities of strangulation of neck.**Material and methods:**This cross sectional study was conducted at Department of Forensic Medicine, Nishter Hospital Multan from July 2016 to June 2017. Total 110 cases of neck strangulation either male or female having age 15 to 60 years were selected from the Department of Forensic Medicine Nishter Hospital Multan. Assessment of neck strangulation was done.**Results:** Mean age of the cases was 25.5 ± 15.9 years. Total 46 (41.82%) cases were <20 years and 26 (23.64%) were between 20-30 years, 11 (10%) cases were between 41-50 years and 13 (11.82%) were >50 years. Male cases were 68 (62%) and female cases were 42 (38%). Hanging, garroting and throttling was noticed in 92 (83.63%) cases, 10 (9.09%) cases and 8 (7.27%) respectively.**Conclusion:** Findings of present study showed that most of the cases were under 20 years of age and males cases was found with higher rate as compared to female cases. Hanging rate was higher as compared to garroting and throttling. Single piece hyoid bone fracture rate was higher as compared to multiple piece fracture.**Keywords:** Strangulation of neck, Garroting, Throttling, Fracture of hyoid bone.**INTRODUCTION:**

A bone between thyroid cartilage and tongue root is known as hyoid bone.¹ It consists of a body, two lesser horns (cornua) and two greater horns.² The bone does not articulate with any other, but is connected to styloid process of temporal bone by the stylohyoid ligaments [2]. Due to its free floating nature its injury is not very common.³ However when fracture is detected during autopsy, it is of great significance in forensic pathology. The strangulation is a form asphyxia

which is characterized by the closure of passage of air and vessels of neck due to neck external pressure. Various modalities of strangulation are hanging, ligature strangulation (garroting) and manual manipulation (Throttling).³

Fracture of hyoid bone is a recognized finding and indication of strangulation (more common in manual strangulation/throttling than by ligature). Detection of hyoid fracture is relevant to the diagnosis of modality of strangulation.⁴ The

fractures of hyoid bone results from direct trauma (auto accidents), trauma to the neck (for example strangulation), muscular pressure and pathological destructions due to tumors. Hyoid fractures originate most commonly from strangulation. These may involve hanging (judicial, accidental, and suicidal), ligature strangulation and manual strangulation.⁴

The exact mechanism of fracture is not clear, however two mechanisms have been suggested in which the hyoid bone may be fractured: from direct lateral compression of neck and from indirect violence.⁵ Fractures occur almost equally on both sides and an insignificant male predominance exists.⁶ It was shown that older age groups are usually more vulnerable to hyoid fracture and other neck injuries, possibly due to increasing brittleness of bone and cartilaginous structures.⁷⁻⁸

The local studies are scanty in this context. The proposed study is on the basis of difference in material used for the constriction of neck in our country as compared to the other parts of the world. In our country usually a piece of cloth, waistband (kamarband), chadar, dupatta and rarely a rope are used. In this region after kidnapping and sexual assaults, mostly victims are murdered by the strangulation of neck. It highlights the need for a study to determine and document the incidence locally. This will also provide a data base for future studies and local hospital policies for postmortem examination, furthermore the frequency of fracture of hyoid bone due to different modalities of strangulation, still is unveiled as far as our country is concerned.

MATERIAL AND METHODS:

This cross sectional study was conducted at Department of Forensic Medicine, Nishter Hospital Multan from July 2016 to June 2017. Total 110 cases of neck strangulation either male or female having age 15 to 60 years were selected from the Department of Forensic Medicine Nishter Hospital Multan. Cases of burn and

drowning were excluded. Age, gender was recorded on pre-designed proforma. Standard autopsy procedure was done and fracture of hyoid bone was assessed. Prior permission from institutional review committee was taken. All the information was collected on especially designed proforma. Mean and SD was calculated for numerical data and frequencies and percentages were calculated for categorical variables.

RESULTS:

Total 110 cases were selected for this study. Average age was 25.5 ± 15.9 years. Selected cases were divided into 5 age groups, age group <20 years, age group 20-30 years, age group 31-40 years, age group 41-50 years and age group >50 years. Total 46 (41.82%) were <20 years, 26 (23.64%) cases were between 20-30 years, 11 (10%) cases were between 41-50 years and 13 (11.82%) cases were >50 years. (Fig. 1) Out of 110 cases, male cases were 68 (62%) and female cases were 42 (38%). (Fig. 2)

Modalities of strangulation of neck as follows: Hanging, garroting and throttling was noticed in 92 (83.63%) cases, 10 (9.09%) cases and 8 (7.27%) respectively (Table 1). Fracture of hyoid bone was noted in 15 (13.64%) cases. Of which 11 (10%) cases and 4 (3.63%) cases found with single piece and multiple piece fracture. (Table 2).

Fig. 1: Age distribution of cases

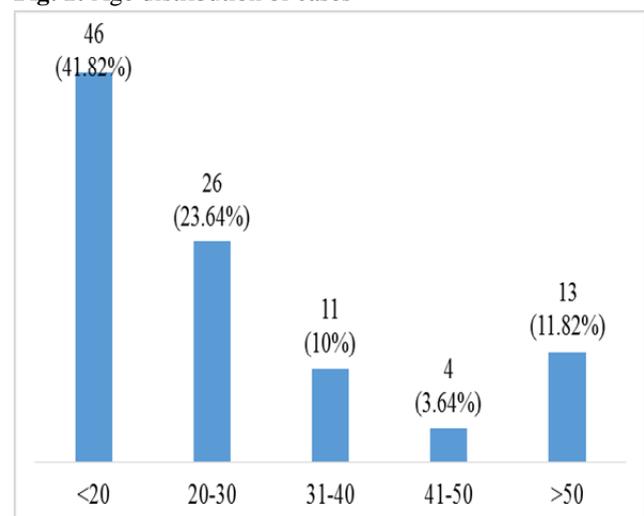


Fig. 2: Gender distribution

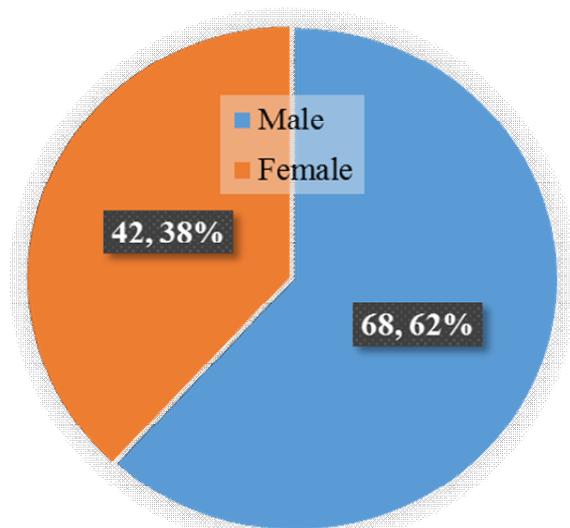


Table-1: Modalities of strangulation of neck

Modalities	Number	Percentage
Hanging	92	83.63
Garroting	10	9.09
Throttling	8	7.27
Total	110	100.0

Table-2: Hyoid bone fracture

Hyoid bone fracture	Number	Percentage
Single piece	11	10
Multiple pieces	04	3.63
No fracture	95	86.36
Total	110	100.0

DISCUSSION:

Fractures of hyoid bone are rare and most of the injuries caused by strangulation. Hyoid bone fractures are usually the result of direct trauma to the neck through manual strangulation or hanging, blunt trauma or from projectiles. Purpose of present study was to assess the

fracture of hyoid bone in various modalities of strangulation of neck.

Mean age of the cases was 25.5±15.9 years. Total 46 (41.82%) were <20 years, 26 (23.64%) cases were between 20-30 years, 11 (10%) cases were between 41-50 years and 13 (11.82%) cases were >50 years. Male cases were 68 (62%) and female cases were 42 (38%). Modalities of strangulation of neck as follows: Hanging, garroting and throttling was noticed in 92 (83.63%) cases, 10 (9.09%) cases and 8 (7.27%) respectively (Table 1). Fracture of hyoid bone was noted in 15 (13.64%) cases. Of which 11 (10%) cases and 4 (3.63%) cases found with single piece and multiple piece fracture.

In present study frequency of hyoid bone fracture was 13.64%. Results of this study are in agreement with the results of a study by Kaheri et al⁷. In some other studies, frequency of fracture of hyoid bone is from 25% to 68%.⁹⁻¹⁰

Another study by Paparo and Siegel demonstrated that of 167 cases of suicidal hangings in New York, fractures occurred in 6% of hyoids, 11% of thyroids, 0.6% of cricoids, and 3% of thyroid and hyoid combined. They found some form of fracture in 20% of their cases.¹¹Uzun et al reported in their study, hyoid fracture was seen in 23.26% of cases. This is also comparable with our study.⁶

Individual reports from the literature show considerable variability. Di Maio DJ and Di Maio VJM¹² found, in 83 hangings, no hyoid fractures, 11% with fractured thyroids, and one fractured cervical spine. In 80 cases in Denmark, Simonsen¹³ found fractures in 9% of hyoids, 28 percent of thyroid cartilages, and 9% combined fractures. In 61 cases from Seattle, Washington, Luke et al¹⁴ report fracture of the hyoid in 23% and thyroid fracture in 13%. No cricoid fracture was found.

In nonjudicial hangings of individuals older than 40 years, the hyoid is fractured in 20% of cases and the thyroid cartilage in about 50%.¹⁵In present study, male cases were 62% and female cases were 38%, which are comparable with the

study of Uzun et al⁶ who reported male cases as 70.56% and female cases as 29.44%.

In another study of suicidal hangings out of 175 cases, male cases were 133 and female cases were 42.¹⁶ In another study, 307 dead bodies were studied of which 275 were male and 42 were female. Fractures of the hyoid bone, thyroid cartilage and cervical vertebrae were found in 29 of these cases; 4 in females (9.5%) and 25 (9.1%) males. Of the fracture observed, 21 were of the thyroid cartilage, 10 were of the hyoid bone, and 3 were of the cervical spine.¹⁷

CONCLUSION

Findings of present study showed that most of the cases were under 20 years of age and males cases was found with higher rate as compared to female cases. Hanging rate was higher as compared to garroting and throttling. Single piece hyoid bone fracture rate was higher as compared to multiple piece fracture.

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