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Henles Spine an Anatomical Landmark for Locating Foramina During Cranial Base Surgeries

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ABSTRACT

Henle's spine, also known as the suprameatal spine/ spina suprameatica/ spin supranationalism is found to guide the lateral wall of the mastoid antrum. Determination of the distances between Henle's spine and the other deeper landmarks can guide the surgeon during surgeries. The aim of this study is to analyse the percentage of presence of Henle spine and to prove by morphometric analysis of the distance between three important foramina in cranial base that it can be used as an useful anatomical landmark to locate these foramina, The study used about 50 South Indian dry human skulls of unknown sex, collected from Department of Anatomy, Saveetha Dental College and Hospitals. Henle's spine was observed in 41 of the 50 skulls examined, The average distance between the Henle's spine and lateral margin of the carotid canal was found to be 29.2 mm, the average distance between the Henle's spine and posterior margin of Jugular foramen in the present study was 35.73 mm and the average distance between the Henle's spine and posterior lateral margin of foramen lacerum in the current study was 46.9 mm. From the current Henle's spine was found to be a useful anatomical landmark to locate these foramina, these data may prove valuable for surgeons in planning cranial base surgeries.

Keywords: Henle's spine, Jugular Foramen, Foramen Lacerum, Carotid Canal, Anatomical landmark

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INTRODUCTION

Henle's spine, also known as the suprameatal spine/spina suprameatica/spina supranationalism is found to guide the lateral wall of the mastoid antrum [1,2]. It is found that the Henle's spine is present in 85% of the human skulls and when present, it could be used as a reliable anatomical landmark for isolating various foramina during skull base surgeries [3]. It is also to be noted that one of the important landmarks found lateral to the mastoid bone is the spine of Henle or the Henle's spine. Determination of the distances between Henle's spine and the other deeper landmarks can guide the surgeon during surgeries [4]. The Henle's spine is one among the other structures which helps to correlate and access the various anatomical structures present during skull base surgeries [5]. A study proves that the most prevalent type of suprameatal spine resembled that of a crest and was found in both males and females on the right (77.6%) and left (80%) sides. The absence of a suprameatal depression was significantly higher in females (right 9.1%; left 8.7%) than in males (right 1.7%; left 2.5%) [6]. The skull base is a complex surface containing various neural and vascular structures which is associated with the cranial fossae, paranasal sinus, nasal depression, circle, and the neck [7]. A study also revealed the different types of suprameatal triangles were deep (38.2%), shallow (42.6%), and slit (12.4%) varieties [8].

With a rich case bank established over 3 decades we have been able to publish extensively in our domain [9-19]. The aim of this study is to analyse the percentage of presence of Henle spine and to prove by morphometric analysis of the distance between three important foramina in cranial base that it can be used as an useful anatomical landmark to locate these foramina.

MATERIALS AND METHODS

The study used about 50 South Indian dry human skulls of unknown sex, collected from Department of Anatomy, Saveetha Dental College and Hospitals. The skulls were observed for the presence of Henle's spine. If present the distance between the Henle's spine and the lateral margin of the carotid canal, the posterior margin of jugular foramen and posterolateral margin of foramen lacerum on the right and left side were measured using a digital vernier caliper. All data were tabulated and statistically analysed.

RESULTS AND DISCUSSION

Henle's spine was observed in 41 of the 50 skulls examined (82%), Aslan et al. has reported that the absence of Henle's spine is 20% and Yilmazer et al., the absence of Henle's spine is reported as 10% [4,20].

The average distance between the Henle's spine and lateral margin of the carotid canal was found to be 29.2 mm, the average distance between the Henle's spine and posterior margin of Jugular foramen in the present study was 35.73 mm and the average distance between the Henle's spine and posterior lateral margin of foramen lacerum in the current study was 46.9 mm (Table 1).

The distance between Henle's spine and these important foramina were also done by various other authors the data from these previous study was compared with the average data of present study in (Table 2) [1,21,22]. The average distance between the Henle's spine and lateral margin of the carotid canal was almost like the study by Kumar et al. [22]. The average distance between the Henle's spine and posterior margin of Jugular foramen in the present study was higher than the study of Ulug et al. [1] and Ray et al. [21] but comparatively lesser to the study of Kumar et al. [10]. The average distance between the Henle's spine and posterior lateral margin of foramen lacerum in the current study is almost equal to all the previous studies.

Table 1: Average distance of Henle's spine from Carotid canal, Jugular foramen, and Foramen Lacerum on the right and left side.

Average distance from Henle's spine and	Lateral margin of Carotid Canal	Posterior margin of Jugular foramen	Posterolateral margin Foramen lacerum
Right in mm	30.4 ± 2.76	36.84 ± 3.98	47.12 ± 1.62
Left in mm	28.07 ± 1.81	34.62 ± 2.54	46.68 ± 1.51

Table 2: Comparative values in dry skull between previous and current study.

Average distance (in mm) from Henle's spine and	(Ulug et al.) [1]	(Ray et al.) [21]	(Kumar et al.) [22]	Current study
Lateral margin of Carotid Canal	28.7	27.6	29.5	29.2
Posterior margin of Jugular foramen	23.4	32	37.7	35.73
Posterolateral margin Foramen lacerum	47	46.1	46	46.9

CONCLUSION

In the present study Henle's spine was found in 82% of skulls examined and on morphometric analysis of the distance between Henle's spine to three important foramina in the cranial base it was found to be a useful anatomical landmark to locate these foramina, these data may prove valuable for surgeons in planning cranial base surgeries.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest in the present study.

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