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Short Communication

An Original Study on Anatomical Variations of Hypoglossal Canal

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ABSTRACT

Hypoglossal canal transmits hypoglossal nerve that supplies motor innervations to the tongue. The canal also contains venous plexus and an arterial branch leading to duramater. Studies on anatomical variations of hypoglossal canal was been a considerable interest to research workers because of their regional and racial importance. A total of 60 skulls were examined for the presence of duplicated canal and its clinical significance.

Key Words: Hypoglossal canal, Duplicate canal, Hypoglossal nerve

INTRODUCTION

Hypoglossal canal is a permanent component of skull in man and animals. [1] Hypoglossal canal is also called as anterior condylar canal that transmits hypoglossal nerve, meningeal branch of ascending pharyngeal artery and an emissary vein from the basilar plexus. [2] Anthropological studies concerned with the nonmetric cranial traits have been increasing in frequency in the last ten years and was first studied by Wood Jones. [3] Berry made a special study of nonmetric cranial variants including double hypoglossal canal. [4] Hypoglossal canal is of great clinical importance when taking into account certain pathological conditions like occipital bone fractures, intracranial and extracranial neoplasms and in congenital defects. [5,6] Present study is done to know the incidence of double hypoglossal canal and to draw significant conclusion.

MATERIALS AND METHODS

About 60 human skulls obtained from the Department of Anatomy, Yenepoya Medical College were used for the purpose of this study. The skulls were observed for variations in the hypoglossal canal, the incidence of double hypoglossal canal, whether it was unilaterally or bilaterally present. Skulls were also closely inspected by the use of hand lens for any variant bony specules and extra foramina. The data thus obtained was tabulated and separated with respect to sides.

RESULTS

Out of 60 skulls studied, double hypoglossal canal was seen only in 12 skulls (in 4 bilaterally and in 8 unilaterally. Thus

the incidence of this cranial variant was 20%.Out of these, It was bilateral in 6.6% cases (Fig1a) and unilateral in 13.3% cases(Fig1b). Bony spur within hypoglossal canal was seen unilaterally in 2 skulls (Fig2).The incidence if this variant was 3.33%. Table 1 shows 4types of combinations in variations of hypoglossal canal with its incidence.

Table1:- Type of combinations in Hypoglossal canal, double canals with their incidence

S.NO	VARIATIONS		NO.OF SKULLS	INCIDENCE
	RIGHT	LEFT		
1	SC	SC	46	76.6%
2	DC	DC	4	6.66%
3	SC	DC	6	10%
4	DC	SC	4	6.66%

SC-Single canal, DC- Double canal,

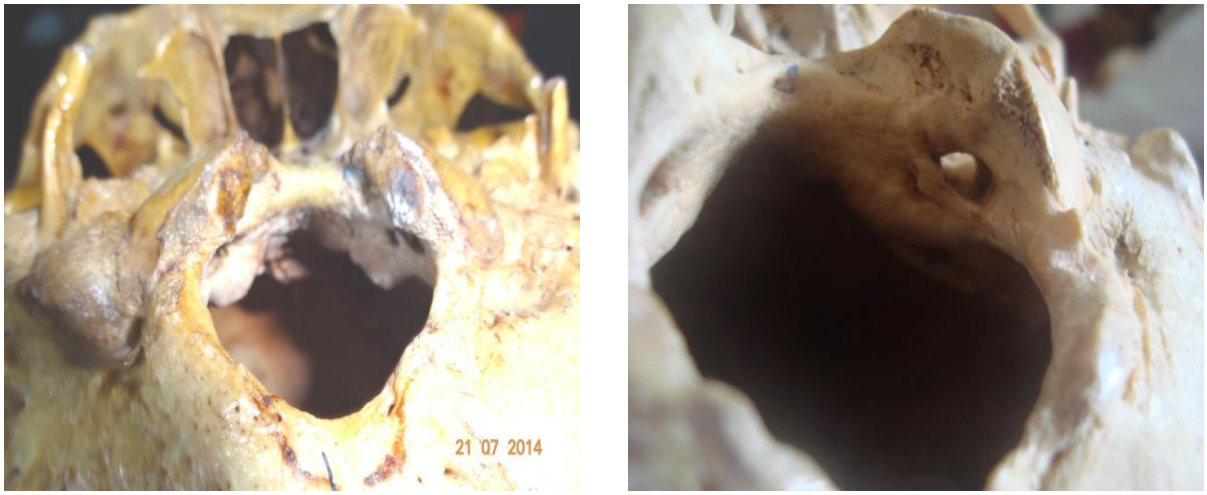

Fig1a:- Double hypoglossal canal Bilaterally, 1b:-Double hypoglossal canal unilaterally

Fig 2a: Showing presence of bony spur in hypoglossal canal,

DISCUSSION

Cranial variants have been studied and being described in textbooks as rare or occasionally found and few have been utilised as anthropological markers. [7] Berry AC suggested that these cranial variants can be used to calculate a distance statistics between population samples. [4] For population studies the trait should be genetically determined and should not show sex or side dependence. In humans it is difficult to assess the degree of genetic control. Since the human variants are analogous to those in mice, genetic background of nonmetric traits in humans can be strongly supported based on study of mice.[8] In the present study, bilateral double hypoglossal canal was noted in 6.6% of dry skulls and unilateral double canal was found in 16.6% 0f dry skulls. So the incidence of double canal in our study was 23%. Zaidi et al showed the incidence of double canal to be 12.5% (5% bilaterally and 7.5% unilaterally)[9] Wyosocki J et al found double hypoglossal canal in 43% of human skulls. [10] Study conducted on human and mammalian species showed the incidence of

double hypoglossal canal to be 43%. [10] Incidence of duplicated hypoglossal canal either bilateral or unilateral was studied in different population [4] as shown in Table2.

Table2:-Comparison of duplicated hypoglossal canal with other studies.

Nigeria 56 skulls	Palestine 54 skulls	Palestine(modern) 18 skulls	Burma 51 skulls	Egypt 250 skulls	North America 50 skulls	South America 53Skulls	North India 53 Skulls	Our study South India 60 skulls
11.6%	7%	8.3%	9.8%	16.6%	24%	27%	17.9%	20%

A study conducted by Bhuller et al in 1998 reported that the hypoglossal canal was divided into two canals by a small bony spicule in 28.12% of cases. [11]

CONCLUSION

Anatomical variations of hypoglossal canal are important for Anatomists, Anthropologists and Clinicians. These non metric variants help us to study embryology without actually dealing with the embryos. Also the difference in incidences of these variants reflects genetic differences between the populations. Hypoglossal canal is clinically important in pathological conditions like occipital bone fractures, congenital defects and intra and extracranial neoplasms. Present study has given the incidence of duplicated hypoglossal canal in South Indian mandibles.

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