

## ORIGINAL RESEARCH

**Study Of The Frontal Notch Or Foramen In North Indian Crania**Zaidi S.H.H<sup>1</sup>, Pankaj Kumar Singh<sup>2</sup>, Jaya Devendra<sup>3</sup>**ABSTRACT**

**Introduction:** Study of cranial variants have been a field of considerable interest to research workers in the past. Frontal notch or foramen is one such cranial variant which is situated medial to the supraorbital foramen.

**Material and methods:** 28 north Indian skulls of U.P. were studied for the Frontal notch/foramen, a cranial variant in the present study. Its distance from the midline and supraorbital foramen was measured.

**Result:** Findings are discussed and compared with other studies which can serve to be of considerable regional and racial significance.

**Conclusion:** The knowledge of this inconsistently appearing anatomic landmark is not only of great surgical importance in maxillofacial surgery but also in performing local anaesthetic block.

**Keywords:** Frontal notch, frontal foramen, cranial variant.

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**INTRODUCTION**

Study of cranial variants, both metric as well as non metric, has always kept the research workers interested as it holds huge clinical significance. One of the earliest study on the non metric cranial variant was done by Todd and Tracey<sup>1</sup> in 1930. Berry and Berry<sup>2</sup> later in 1967 linked many of these cranial variants to a specific race. Apart from the regional and racial significance these cranial variants are also of great importance as an anatomical landmark while performing surgery and local anaesthetic block. Our current

study was on frontal notch or foramen sometimes present in the human skull. Frontal notch or foramen is a well defined inconstant notch sometimes seen, lying medial to the supraorbital foramen in the supraorbital rim. Frequently a cluster of tiny foramina may be seen. When present this notch or foramen allows passage to supratrochlear vessels and the medial branch of supratrochlear nerve. Our current study was an attempt to find out the frequency of the frontal notch or foramen in North Indian skulls. The distance of this cranial variant was measured from the nasion, a midline landmark present in the skull and also from the supraorbital foramen. The frequency, as well as the distance from the midline and supraorbital foramen, were compared to similar studies done previously by various research workers. This study holds a lot of significance as frontal notch or foramen when present is an important surgical landmark especially with the advent of minimally invasive surgery.

**MATERIAL AND METHODS**

The current study was done in the Anatomy department of Rohilkhand Medical College, Bareilly, Uttar Pradesh. 28 north Indian human crania were obtained from the museum of Anatomy department and were examined for this study. Incidence of frontal foramen or notch was noted in these crania. A midline landmark nasion was marked in the skull. The distance of frontal notch or foramen from the nasion was noted using a sliding caliper. The distance of this cranial variant was also noted from the supraorbital foramen which lies lateral to it in the supraorbital rim.

**RESULTS**

Out of 28 skulls studied frontal notch (figure-1) or foramen were seen only in 8 skulls (28.5% cases). All the cases were unilateral of which 5 were found on the right side and 3 on the left side. All the cases were frontal notch as no foramen was seen in our study. The average distance of the frontal notch from the nasion was 19mm while the distance from the supraorbital foramen was 5.5 mm.

Egypt (summed)	Nigeria (Ashanti)	Palestine (Lachish)	Palestine (Modern)	India (Punjab)	Burma	North America (British Columbia)	South America (Peru)	Our study (U.P) North India
250	56	54	18	53	51	50	53	28
Skulls	Skulls	Skulls	Skulls	skulls	skulls	skulls	skulls	skulls
32.2%	30.4%	18.5%	21%	32%	32.4%	40%	45.3%	28.5%

**Table-1:** (Berry<sup>12</sup>-1975) Frontal foramen or notch

## DISCUSSION

Cranial variants have aroused the curiosity of anatomists for many decades. One of the earliest case reported was by Le Double.<sup>3</sup> It was Wood Jones<sup>4</sup> however who first proposed that the differing incidences of these minor variants which occurred in different races might be useful in anthropological studies. Laughlin & Jorgensen<sup>5</sup> was the first to put this idea in practice. This work is concerned with description of the frontal notch or foramen as well as determining the racial and regional incidence of this important cranial variant.



**Figure-1:** Frontal notch / foramen

While like most other variants, the cranial variant hardly merits any description in anatomical literature beyond being referred to as rare and occasionally found, nevertheless a few of them have been utilized as anthropological markers as shown by Brothwell<sup>6</sup>. Berry and Berry<sup>2</sup> was strongly of the opinion that majority of the cranial variant resulted from normal developmental process having a strong genetic predisposition. However Moller-christensen and Sandison<sup>7</sup>, Roche<sup>8</sup> and Dorsey<sup>9</sup> were from a different school of thought that postulated that some variants are consequences of disease or other extrinsic influences. The frequency of any particular variant is more or less constant in a given race and is somewhat similar in related races. Chambellan<sup>10</sup> seems to have been first to suggest the possibility of using such traits as anthropological characters. Russel<sup>11</sup> used the data gathered on a number of skull variants to good effect in comparing the various population groups of America. A similar but more systemic comparison of the far eastern group was undertaken by Woodjones.<sup>4</sup>

Berry and Berry<sup>12</sup> made a special study of non-metrical human cranial variations including frontal foramen or notch. His findings are given in the table-1 and are compared to our study of incidence of frontal notch in north Indian crania. The morphometric measurement of the frontal notch or foramen was more recently conducted by Saylem et al<sup>13</sup>. In our study it was observed that frontal foramen or notch was present in 28.5% of crania (table -1). Hence the current study provides valuable data from U.P. the largest state of India, and compares the same with data of different global regions. The distance of the notch from the nasion in our study was about 21 mm which was in accordance to the finding of Saylem et al who found it to be 20.24mm. The distance from the laterally lying supraorbital foramen was 5.5 mm while Saylem et al found it to be 4.99mm.

## CONCLUSION

The anatomy of the supraorbital region is of importance to not only the maxillofacial surgeons but also to the anaesthetists in giving local blocks, since the supraorbital nerve passes through the supraorbital foramen and the medially lying frontal notch or foramen allows passage to the supratrochlear nerve. Injury to these nerves have in past resulted in hypoaesthesia or anaesthesia of the forehead, subgaleal haematoma and necrosis of forehead flap. Our study is aimed at throwing more light at the anatomy of this region along with the possible variations that might be encountered.

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