



INCIDENCE OF ACCESSORY OPTIC CANAL IN DRY HUMAN SKULLS OF RAJASTHAN STATE

Anatomy

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ABSTRACT

Introduction: Duplication of optic canal is very rare anomaly which has been seen in both sexes, at various ages and in a number of races. Duplications may be unilateral or bilateral out of which the bilateral duplications is a very rare phenomenon. The present study was undertaken with the aim to determine the incidence of accessory optic canal in dry human skulls of Rajasthan State. **Materials and Methods:** The present study was conducted using 400 dried human skulls which were thoroughly examined for the presence of unilateral or bilateral accessory optic canals. **Results:** It was found that out of 400 skulls studied, the incidences of Accessory Optic Canal (AOC) were present in 14 (3.5%) skulls. The AOCs were present unilaterally on the right side in 6 (1.5%), unilaterally on the left side in 5 (1.25%) and bilaterally in 3 (0.75%) skulls. **Conclusion:** The clinical awareness of duplication of optic canal increases the success rate of surgical procedure of optic canal like decompression, tumour excision, approaching sella turcica, cavernous sinus approach, pneumatization procedures.

KEYWORDS

Duplication, Accessory optic canal, Optic canal, Incidence

INTRODUCTION

Foramina or opening in the skull are very important as many important structures such as nerves and blood vessels traverse through them.

At the apex of the orbit, there is the opening of the optic canal which is one of the channels of communication between orbit and middle cranial fossa. The optic canal transmits the optic nerve, ophthalmic artery, and sympathetic nerve fibers¹. Detailed anatomy of the optic canal is important to decipher the various pathologies of the region as well to guide surgical procedures and therapeutic options. Variations in foramina have been studied by various authors. They showed that these variants have been associated with many clinical conditions such as osteopetrosis, osteoporosis, crurosis syndrome, neurofibromatosis, brachymicrocephaly, mental retardation¹⁻³.

Optic canal may show duplications. Duplication of optic canal is very rare anomaly which has been seen in both sexes, at various ages and in a number of races. Duplications may be unilateral or bilateral out of which the bilateral duplications is a very rare phenomenon.⁴ The present study was undertaken with the aim to determine the incidence of accessory optic canal in dry human skulls.

MATERIALS & METHODS

The study was conducted on 400 dry human skulls of unknown age & sex procured from the Department of Anatomy, Sawai Man Singh Medical College, Jaipur and various other medical colleges of Rajasthan. They were thoroughly examined for the presence of unilateral or bilateral accessory optic canals (Fig. 1) by using a magnifying lens (Fig. 2) and their patency were checked by passing a probe.

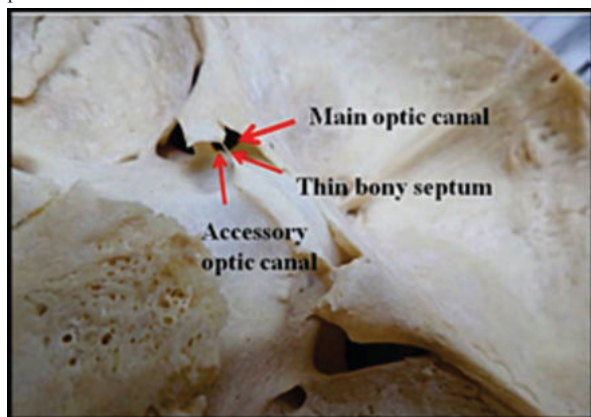


Fig. 1:- The Main Optic Canal and Accessory Optic Canal being separated by a thin bony septum as observed in the Skull Bone.



Fig. 2:- A Magnifying Lens

RESULTS

The incidences of Accessory Optic Canal (AOC) have been depicted in tabulated form in Table 1 whereas Fig. 3 shows the graphical representation of the observed data.

Table 1:- Incidences (%) of AOC in 400 dry human skulls.

Characteristics	N	In %
Uni (Right)	6	1.50%
Uni (Left)	5	1.25%
Bi (Rt + Lt)	3	0.75%
Total	14	3.50%

It was found that out of 400 skulls studied, the incidences of AOCs were present in 14 (3.5%) skulls. The AOCs were present unilaterally on the right side in 6 (1.5%), unilaterally on the left side in 5 (1.25%) and bilaterally in 3 (0.75%) skulls.

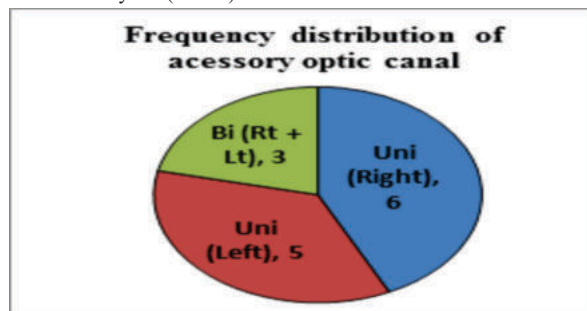


Fig. 3:- Graphical representation depicting the Incidences of AOC in 400 dry human skulls.

DISCUSSION

The incidences of Accessory Optic Canal is rare. Several authors have previously studied the significance of AOC as mentioned in Table 2 & Table 3. Fig. 4 & Fig. 5 depicts the graphical representation of the tabulated data in Table 2 & Table 3 respectively.

Table 2: Comparing incidence of Accessory Optic Canal by various Indian authors with present study.

Authors	n	Incidence	In %
Ghai et al ⁵	194	5 (3 Bi, 2 Uni)	2.58%
Sweta et al ⁶	67	3 (1 Bi, 2 Uni)	4.48%
Purohit B et al ⁷	150	1 (1 Uni)	0.67%
Shinde et al ⁸	100	1 (1 Uni)	1.00%
Nayak et al ⁹	100	3 (2 Bi, 1 Uni)	3.00%
Patil et al ¹⁰	400	11 (3 Bi, 4 Uni Rt, 4 Uni Lt)	2.75%
Singh M et al ¹¹	435	13 (7 Bi, 4 Uni Rt, 2 Uni Lt)	2.99%
Math et al ¹²	316	2 (1 Uni Rt, 1 Uni Lt)	0.63%
Present study	400	14 (3 Bi, 6 Uni Rt, 5 Uni Lt)	3.50%

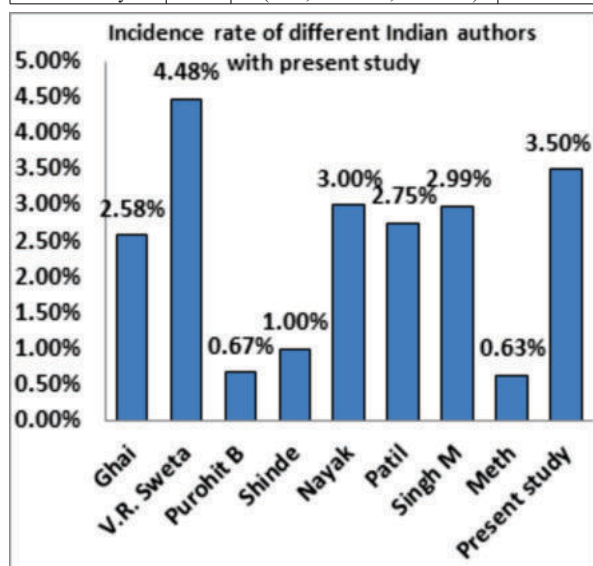


Fig. 4:- Graphical representation depicting the Incidence rate of different Indian authors with present study.

From the above table, it was concluded that results of Purohit B, Shinde and Math are statistically significant comparing to present study with all p -values are < 0.05 . It means incidence of these authors is less as compared to present study.

Table 3: Comparing incidence of Accessory Optic Canal by various Foreign authors with present study.

Authors	n	Incidence
Orhan et al ¹³	369	0.54%
Keyes et al ¹⁴	2187	1.65%
Berlis et al ¹⁵	60	2.50%
Present study	400	3.50%

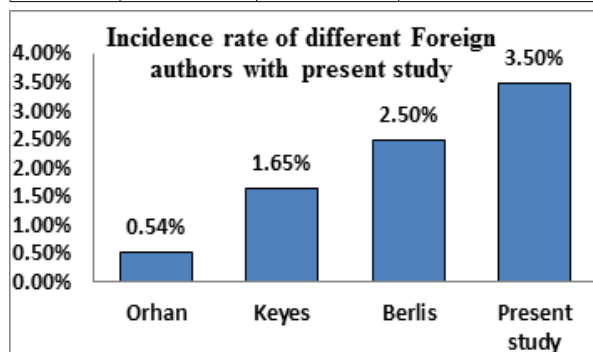


Fig. 4:- Graphical representation depicting the Incidence rate of different Foreign authors with present study.

From the above table it was concluded that result of author Orhan and

Keyes is statistically significant as compared to present study with both p -values are < 0.05 , means incidence of author Orhan and Keyes is less as compared to present study.

CONCLUSIONS

The clinical awareness of duplication of optic canal increases the success rate of surgical procedure of optic canal like decompression, tumour excision, approaching sella turcica, cavernous sinus approach, pneumatization procedures. While doing endoscopic optic nerve decompression in sphenoid-ethmoidal injuries and malignancies, one should be aware of accessory optic canals.

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