



STUDY OF ANATOMICAL VARIATIONS OF CEREBRAL MR VENOGRAPHY IN TERTIARY CARE HOSPITAL.

Neurology

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ABSTRACT

Purpose:MR venography is an important tool for evaluation of vascular headache and its helps to identify the cerebral venous thrombosis. This study is to identify the anatomical variations in the cerebral venous sinus and the gender difference in the population who have attended the headache clinic for evaluation .Knowledge of normal variant in the cerebral dural venous sinus anatomy seen on magnetic resonance(MR) venography is essential to diagnosis of normal variant cerebral venous sinus and to avoid overdiagnosis of cerebral venous thrombosis.

Materials and Methods:A retrospective study was conducted to study the normal anatomy of the intracranial venous system and its normal variation, as depicted by 3D MR venography, and any gender-related differences in patients those were treated for vascular headache from October 2017 to november2017 in K.A.P.V.Govt.Medical College and Mahatma Gandhi Memorial Govt.Hospital

Results:A total of 40 patients (13 men, 27 women, age range 06 to 70years) were included in the study.

Hypoplastic in left transverse sinus and sigmoid sinus was the most common anatomical variation in 15 (37.5%) patients. Left transverse sinus was hypoplastic in more commonly in female in comparison to male (80% versus 20%).

Hypoplastic in right transverse sinus and sigmoid sinus was the most common anatomical variation in 04 (10 %) patients. Right transverse sinus was hypoplastic in more commonly in female in comparison to male (75% versus 25%).

Normal anatomical variation of transverse sinus and sigmoid sinus in 21 (52.5%) patients.

Conclusion:Hypoplastic left transverse sinus is the most common anatomical variation and more common in female compared to male in the present study. Other anatomical variations of dural venous sinuses are not significantly differ among both genders.

KEYWORDS

Normal brain anatomy, Cerebral venous anatomy,Magnetic resonance (MR) venography ,Superior sagittal sinus, Straight sinus , Transverse ,Sigmoid sinus and jugular veins.

INTRODUCTION

PURPOSE:

Magnetic resonance venography (MRV) plays important role in studying anatomy of the intracranial venous system and its variation to look for any pathology and misinterpretation of its normal variation¹. It can also be done from various other methods like CT Venogram & Conventional catheter venography but MR Venography is having overdue benefits like it is non-invasive, does not require ionic radiation exposure or use of any paramagnetic contrast agent administration because of Time of flight (TOF) and Phase Contrast (PC) MR technique, which is most commonly use and provides higher signal to noise and short image time .Knowledge of normal variant in the cerebral dural venous sinus anatomy seen on magnetic resonance(MR) venography is essential to diagnosis of normal variant cerebral venous sinus and to avoid overdiagnosis of cerebral venous thrombosis.

The purpose of our study is to retrospectively study the normal anatomy of the intracranial venous system and its normal variation, as depicted by 3D MRV, in vascular headache patients and any gender-related differences^{1,2,3,4}.

MATERIALS AND METHODS:

Vascular headache Patients, those were sent for MRV examination in K.A.P.V.Govt.Medical College and Mahatma Gandhi Memorial Govt.Hospital from October 2017 to November 2017 were enrolled in this study. MRV data of 40 patients during study period was retrospectively reviewed. Patients with more than 06 to 70 years of age were included in this study.

MR Imaging was performed with superconducting Siemens MAGNETOM Symphony 1.5-Tesla MRI machine and standard head coil. Three- dimensional MR venography was performed in the coronal plane.

MRV AXIAL,CORONALAND SAGITTAL IMAGES:

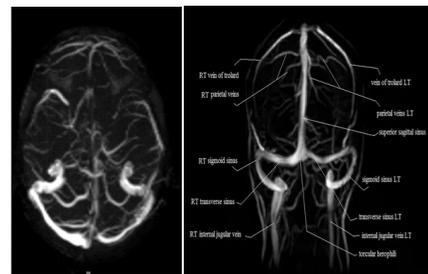


Fig: 1 showing MRV axial and coronal images

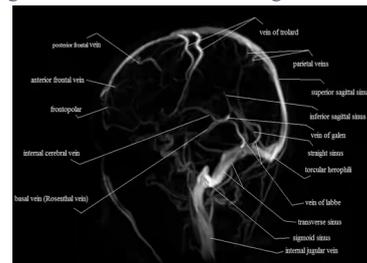


Fig: 2 showing MRV sagittal images

PROTOCOL FOR MRI BRAIN WITH MR VENOGRAM:

INDICATIONS:

Evaluation of intracerebral veins and intradural venous sinuses for thrombosis.

CONTRAINDICATIONS:

Presence of cardiac pacemaker or artificial heart valve, metal plate pin or other metallic implant, insulin or other drug pump, aneurysm clips, cochlear implant are contraindicated.

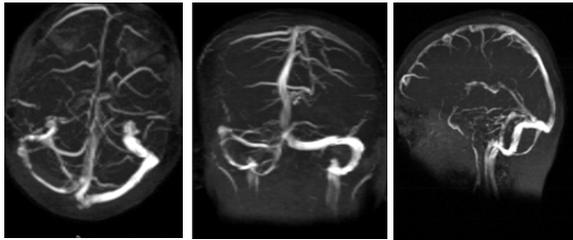
The dural venous sinuses included in this study are superior sagittal sinus, sigmoid sinus, transverse sinus, straight sinus and occipital sinus.

The normal variations of transverse and sigmoid sinuses were noted. The transverse sinuses were measured 1 cm from the Torcula heterophili and the sigmoid sinuses were measured 1 cm from the transverse sigmoid junctions. Their liner measurement were compared with the superior sagittal sinus. If the linear measurement was less than half the size of the superior sagittal sinus, it was considered hypoplastic and if not visualised it was considered aplastic or atretic sinus^{2,4}.

The internal jugular veins were not included in the study associated with adjacent entering cortical veins.

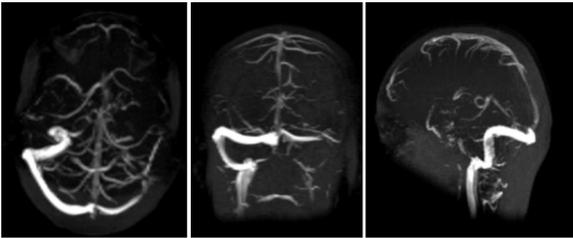
Statistical Analysis Numeric values were shown as the mean ± standard deviation. Chi-square contingency analysis was used to explore the statistically significant difference of MRV variations among both males and females

Normal variant of venous sinus³:



Hypoplastic in right side transvers sinus and sigmoid sinus

Normal variant of venous sinus³:



Hypoplastic in left side transverse sinus and sigmoid sinus.

NORMAL VARIANT OF MR VENOUS SINUSES FINDINGS

S.NO	FINDINGS	FREQUENCY
1.	NORMAL STUDY	21
2.	RIGHT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	04
3.	LEFT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	15
	TOTAL	40

FINDINGS IN RELATION TO GENDER

S.NO	FINDINGS	MALE	FEMALE	TOTAL
1.	NORMAL STUDY	09	12	21
2.	RIGHT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	01	03	04
3.	LEFT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	03	12	15
	TOTAL	13	27	40

PATTERNS OF FINDINGS IN RELATION WITHAGE

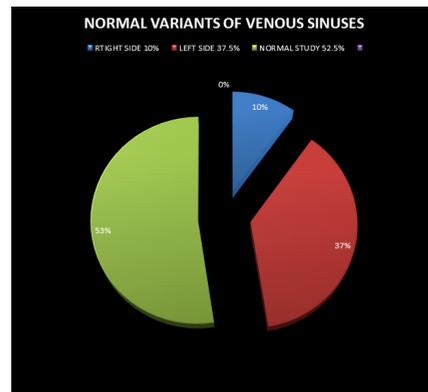
FINDINGS	0-09	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
NORMAL STUDY	02	03	05	05	02	02	01	01	-	-	21
RIGHT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	-	-	01	01	01	01	-	-	-	-	04

LEFT SIDE HYPOPLASTIC IN TRANSVERS AND SIGMOID SINUS	-	02	03	02	02	03	03	-	-	-	15
TOTAL		02	05	09	08	05	06	04	01	-	40

AGE DISTRIBUTION

S.NO	AGE GROUP	FREQUENCY
1.	0-09	02
2.	10-19	05
3.	20-29	09
4.	30-39	08
5.	40-49	05
6.	50-59	06
7.	60-69	04
8.	70-79	01
9.	80-89	-
10.	90-100	-
	TOTAL	40

CHART



RESULTS

Our study included A total of 40 patients (13 male, 27 female) age range 6 to 70years were included in the study.

Hypoplastic in left transverse sinus and sigmoid sinus was the most common anatomical variation in 15 (37.5%) patients. Left transverse sinus was hypoplastic in more commonly in female in comparison to male (80% versus 20%)^{5,7}.

Hypoplastic in right transverse sinus and sigmoid sinus was the most common anatomical variation in 04 (10 %) patients. Right transverse sinus was hypoplastic in more commonly in female in comparison to male (75% versus 25%).

Normal anatomical variation of transverse sinus and sigmoid sinus in 21 (52.5%) patients.

Rest of anatomical variations of the transverse and other sinuses were not significantly differ among both genders.

DISCUSSION:

The study was conducted to evaluate the normal anatomical variations in intracranial venous sinuses and gender differences of normal variations in the western Indian population.

Hypoplastic left transverse and sigmoid sinus was the most common anatomical variation, predominantly in female compared to male.

Left transverse and sigmoid sinus was hypoplastic in 37.5% patients⁶. Right transverse sinus was hypoplastic in 10% patients.

Normal anatomical variation of transverse sinus and sigmoid sinus in 21 (52.5%) patients.

CONCLUSION:

Hypoplastic left transverse sinus is the most common anatomical variation and more common in female compared to male in the present study. Other anatomical variations of dural venous sinuses are not

significantly differ among both genders.

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