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Post-traumatic Cerebral Venous Sinus Thrombosis: Prevalence and Risk Factors

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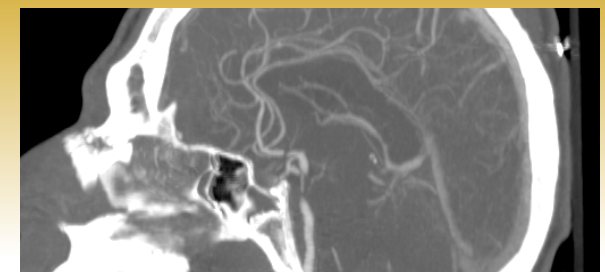
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The data associated with this publication are not available for this reason: N/A

# Post-traumatic Cerebral Venous Sinus Thrombosis: Prevalence and Risk Factors



## BACKGROUND

The dural or cerebral venous sinuses are structures that drain blood from the brain and return it to the heart via the internal jugular veins. Thrombosis can occur in these structures from hemostasis or direct endothelial cell injury

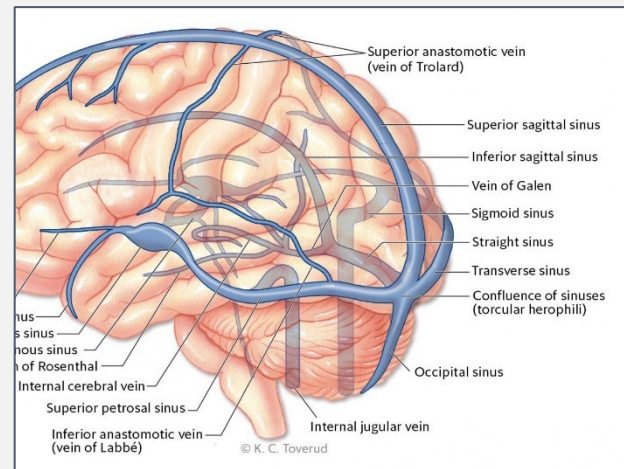


Figure 1. Cerebral Venous Sinus Anatomy<sup>1</sup>.

- Overall annual incidence of CVST of 0.2-1.3 per 100,000 people.<sup>2</sup>
- CVST prevalence of 29.2% among 140 cases with a skull fracture that crossed a cerebral venous sinus.<sup>2, 11</sup>
- Higher incidence among females and neonates.<sup>2-10</sup>
- The objective of this research is to add to the current body of knowledge regarding the prevalence and risk of CVST in the setting of acute, blunt trauma to aid in clinical decision-making and management of TBI patients.

## METHODS

Data were taken from the UC Davis TBI Registry between October 2008 and June 2017 and 4,886 total cases were identified.

- 4,886 total cases in registry
- 1,748 cases identified with skull fractures
- 144 cases met inclusion criteria
- 9 cases are pending evaluation and were not included in current analysis

### Analysis

- CT Angiograms and MR Venograms used to identify intraluminal occlusions
- Fractures characterized by bone and crossing of sinus or suture

Final data analysis was conducted using SPSS to characterize prevalence of CVST by fracture location and correlate with demographics and risk factors.

## METHODS (CONT.)

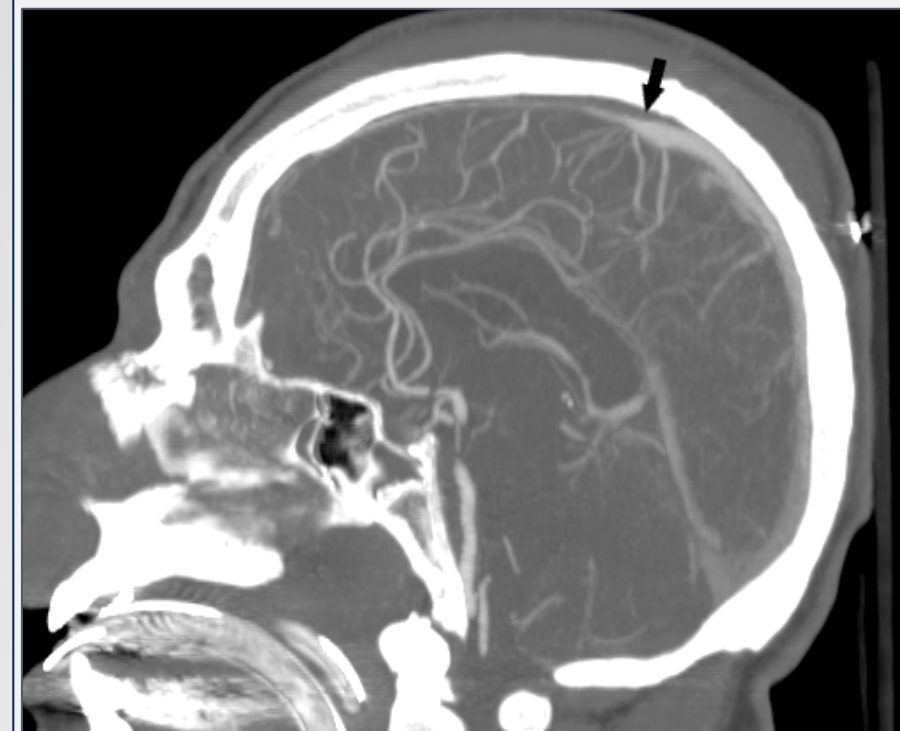
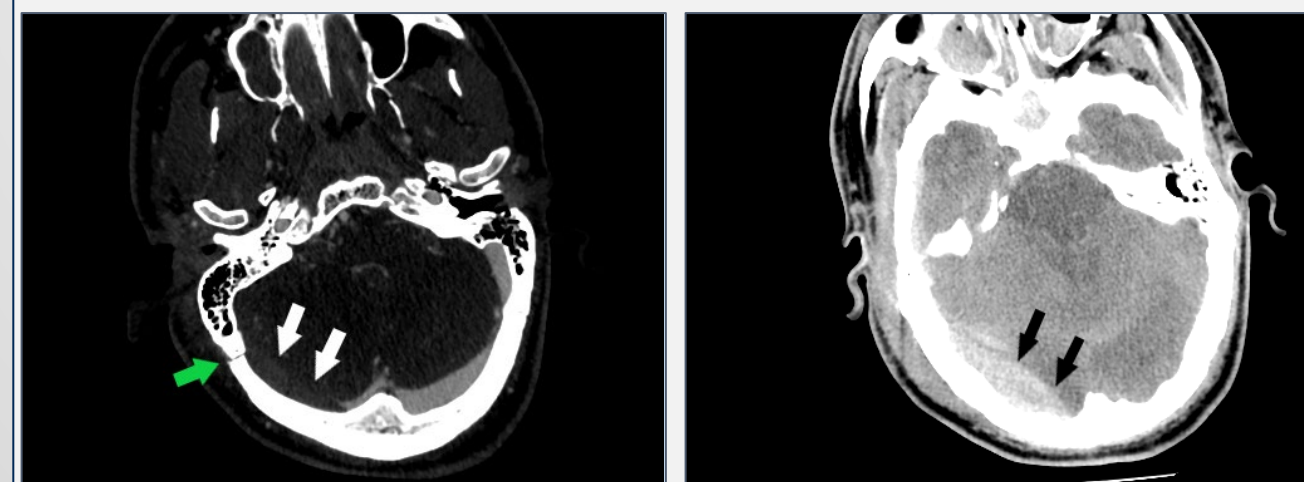
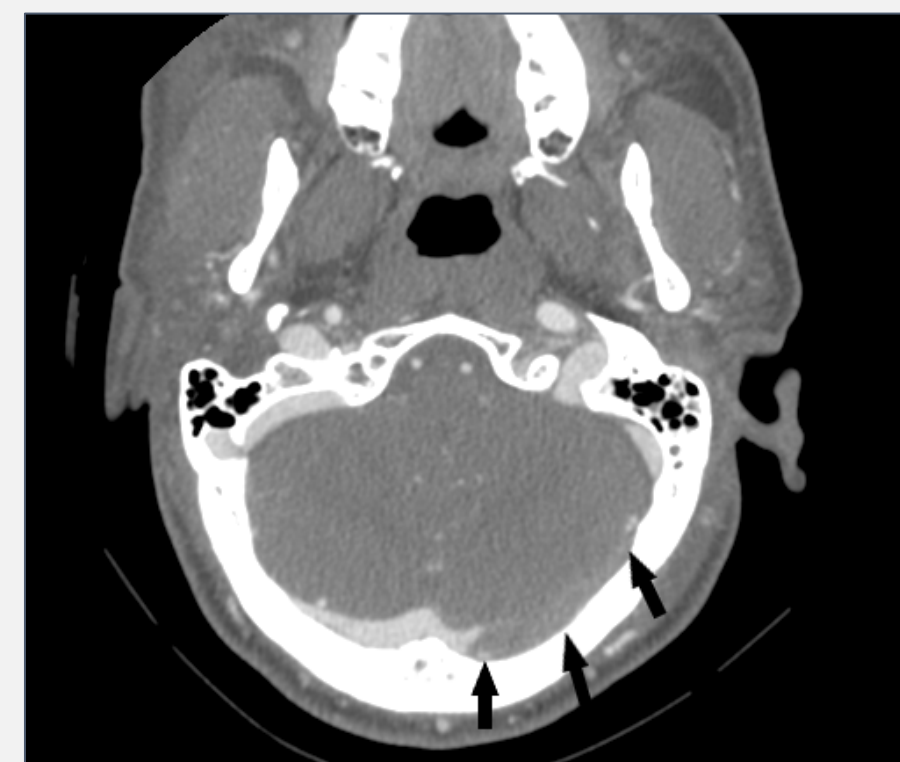


Figure 2. Example of thrombosis identified in superior sagittal sinus (black arrow) on CTA.

Figure 3. Example of thrombosis causing complete occlusion of left transverse sinus (black arrows) on CTA.



Figures 4 & 5. Example of identification of extraluminal vs. thrombotic occlusion of right transverse sinus (white arrows) on CTA by an epidural hematoma (black arrows) on CT. These cases were not included in final count of thromboses. Also pictured is fracture of right temporal bone (green arrow) overlying right transverse sinus and associated diastasis of right occipito-mastoid suture.

## RESULTS

Prevalence of CVST by Sex (N=135)

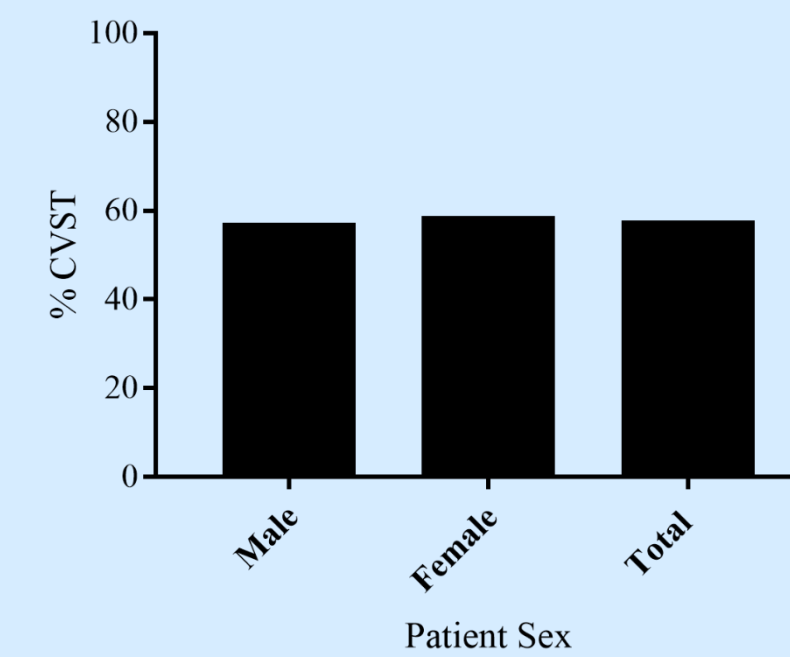


Figure 6. Prevalence of CVST by sex and total sample.

Prevalence of CVST by Age (N=135)

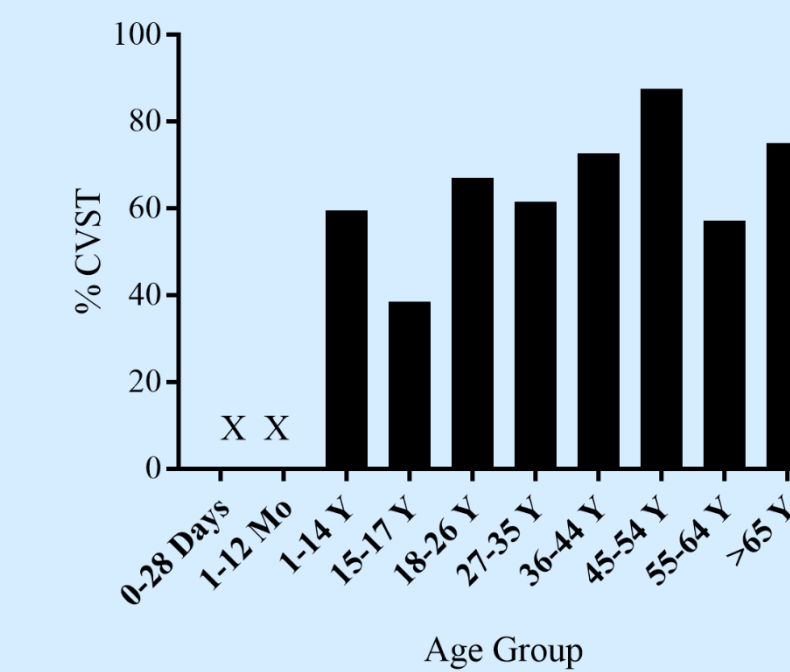
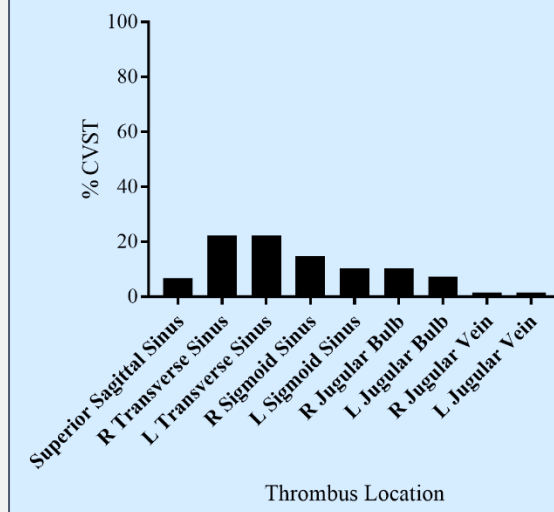


Figure 7. Prevalence of CVST by age group. "X" denotes 0 cases.

Prevalence of CVST by Sex (N=135)



Prevalence of CVST by Fracture Location (N=135)

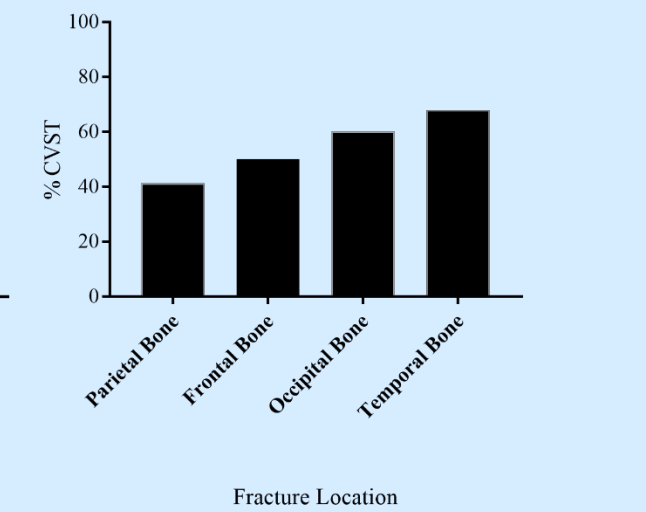


Figure 8. Prevalence of CVST by thrombus location and fracture location. Some cases were counted twice if multiple fractures or thrombi were present.

## CONCLUSIONS

- Total prevalence of CVST among cases with fracture crossing sinus is 57.7% which is much higher than previously reported prevalence.
- No difference in prevalence of CVST among males vs. females.
- No statistically significant difference among age groups.
- Highest prevalence of thrombosis found in transverse sinuses versus previously research showing higher prevalence in superior sagittal sinus.
- Additional research needed with larger sample sizes to find true prevalence and statistically significant risk factors.

### Limitations

- Small sample size
- Missing imaging
- Researcher expertise

### Next steps

- Study clinical management and outcomes of patients with CVST in the setting of acute head trauma.

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