

## LEFT VEIN OF LABBÉ THROMBOSIS ASSOCIATED WITH IPSILATERAL DURAL SINUS THROMBOSIS: NON-ENHANCED CT AND CONTRAST-ENHANCED CT (CTV) FINDINGS

D.I. Stýblo-Šramek<sup>1</sup>, G. De Temmerman<sup>1,2</sup>, B.M. Verbist<sup>1</sup>

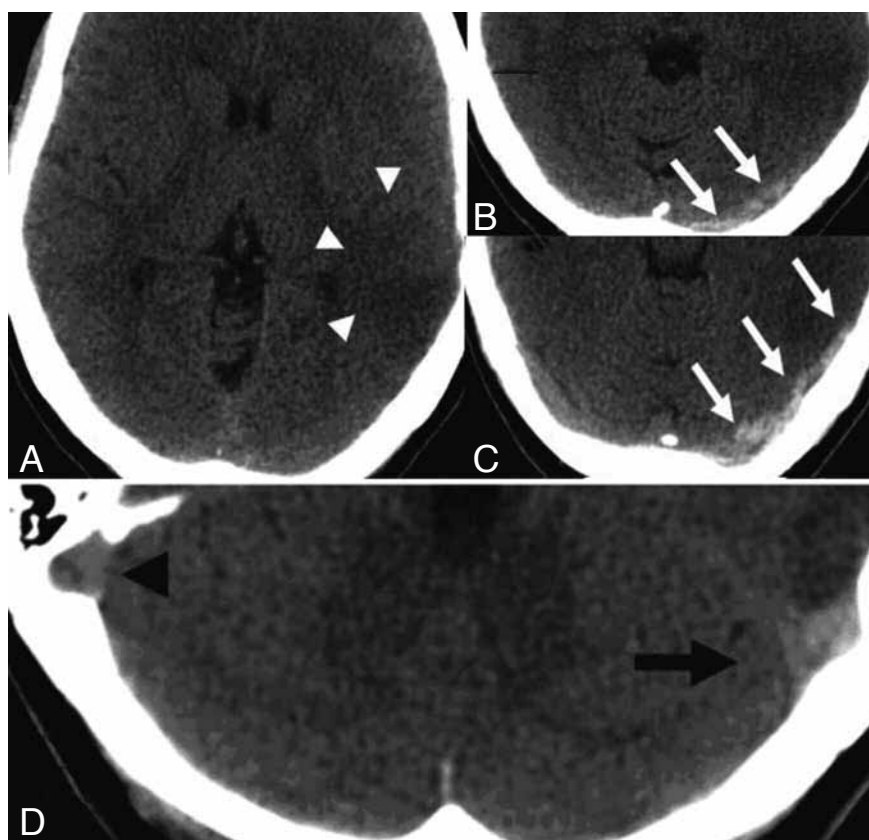
**A rare case of aseptic thrombosis of the left vein of Labbé in a young woman is reported. Cerebral venous thrombosis was suggested by computed tomography and confirmed after intravenous administration of contrast by computed tomography venography. The combination of the clinical setting with the findings on the non-enhanced CT may favour the diagnosis of vein of Labbé thrombosis. The diagnosis can be confirmed on computed tomography venography.**

**Key-word:** Cerebral blood vessels, thrombosis.

Cerebral venous and sinus thrombosis accounts for less than 1% of all strokes and the estimated annual incidence is 3 to 4 cases per 1 million (1). Isolated involvement of superficial cortical veins is very unusual; involvement of an anastomotic vein like the vein of Labbé is extremely rare (2). Labbé's vein (the inferior anastomotic vein) connects the superficial middle cerebral vein posteriorly over the lateral aspect of the temporal lobe to the transverse sinus. Its calibre shows an inverse relationship with that of Trolard's vein (the superior anastomotic vein connecting the superficial middle cerebral vein to the superior sagittal sinus) (3). We report a case of aseptic thrombosis of the left vein of Labbé associated with an ipsilateral dural sinus thrombosis, suspected on non-enhanced CT and confirmed on CT venography (CTV).

### Case report

A 32-year-old woman was admitted to the psychiatry department after a suicide attempt following one week of severe headache she developed shortly after delivering her first child. The pregnancy had been uncomplicated. There was no relevant medical history. Neurologic examination on admission revealed no abnormalities. Routine laboratory findings were normal. The patient was evaluated with a non-enhanced CT followed by CT venography with use of a GE 16-MDCT scanner with a 3-D workstation. Non-enhanced CT was obtained with 2,5 mm-thick contiguous axial sections through the



**Fig. 1.** — Non-enhanced CT with axial reformatted images. Note the venous infarct in the left temporal lobe (white arrowheads) (A) and the hyperdense overlying vein of Labbé and transverse sinus on the same side (white arrows)- "the cord sign" (B, C). The left sigmoid sinus (black arrow) is hyperdense compared to the right side (black arrow-head) indicating a fresh thrombus on the left side (D).

posterior fossa followed by 5,0 mm-thick contiguous axial sections to the vertex. Non-enhanced computed tomography demonstrated an area of gyral swelling with effacement of

the sulci along with subcortical hypodensity in the posterior part of the temporal lobe on the left side (Fig. 1 and 2). A dense tubular structure (cord sign) was seen overlying the occipitotemporal convexity in close proximity to the abnormal temporal area. In this location also considering the size of the structure, it had to be a vein travelling in the subarachnoid space. A meticulous look to the ipsilateral transverse and

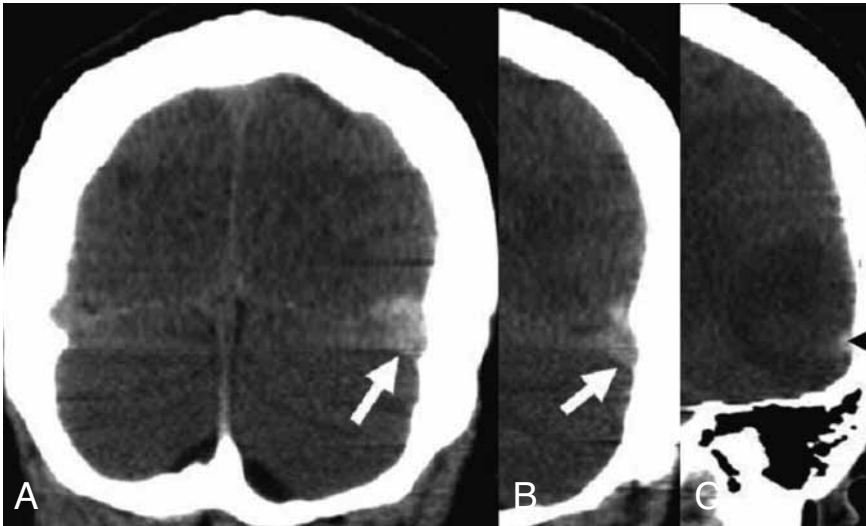


Fig. 2. — Non-enhanced CT: coronal multiplanar reconstructions. Note the hypodense area in the left temporal lobe (C) and the hyperdense overlying vein of Labbé (black arrowhead) (C). The transverse sinus is also hyperdense due to fresh thrombus (white arrow) (A, B).

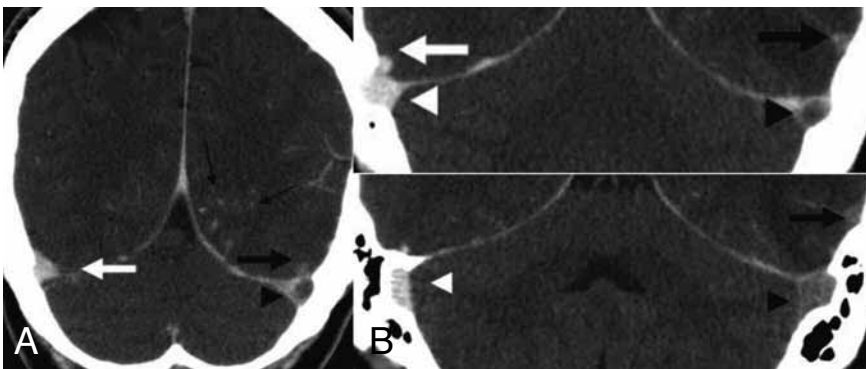


Fig. 3. — CT venography with coronal reconstructions. Note the enhancement of the Labbé's vein (white arrow) and the transverse and sigmoid sinus (white arrowhead) on the right side as compared to the filling defect on the left side due to fresh thrombus (black arrow and arrowhead). Also compare figure 3 to figure 2 and note that the fresh thrombus is mildly hyperdense and does not enhance. Note collateral veins in the ipsilateral medial occipital area (small black arrows) (1).

sigmoid sinuses showed a subtle hyperdensity compared to the right side. The diagnosis of cerebral venous and dural sinus thrombosis was considered and contrast-enhanced CT or CT venography was performed to confirm or exclude the assumed diagnosis. CT venography was performed with a minimum section thickness of 0,625 mm and a pitch of 1 scanning caudally from the calvarial vertex to the skull base. The obtained images were reformatted retrospectively to images with 1-mm collimation and 1-mm spacing for 3-D reconstructions. 80 mL nonionic contrast material was administered at a rate of 3 mL/sec by means of a power injector and a 20-gauge catheter in an antecubital vein with a 80-second prescanning delay. CT

venography showed no enhancement of the left vein of Labbé and the ipsilateral transverse and sigmoid sinus (Fig. 3). Dilated tortuous collateral venous pathways were noted on the left side in comparison to the right side. Anticoagulant therapy was started and the patient recovered completely. She had no clinical sequelae, although follow-up CT-scan after 6 and 14 months demonstrated some tissue loss due to venous infarction within the left temporal lobe where we saw gyral swelling and subcortical oedema (images not shown).

#### Discussion

The vein of Labbé is known to collect blood from the cortical veins of

the lateral temporal lobe and drains into the transverse sinus. The lower cerebral veins drain the temporal and posterolateral occipital lobes. They may either drain into the vein of Labbé or terminate separately in the transverse sinus (3). There are ten reports of thrombosis of the left vein of Labbé in the radiological literature. There is no description of thrombosis of the right vein of Labbé. Clinical signs of cerebral venous thrombosis in patients with an isolated occlusion of the Labbé's vein described in the literature are receptive aphasia, motor aphasia, amnesic aphasia, alexia and agraphia. In our case, the symptom was non-specific but in combination with the clinical setting (young woman, post-partum period) was suggestive of cerebral venous and or sinus thrombosis. CT scanning is a useful screening technique for a quick evaluation of acute neurologic signs, to rule out cerebral disorders like haemorrhage, hydrocephalus and space-occupying lesions. In the appropriate setting one should always look for signs of cerebral venous and dural sinus thrombosis. Signs on non-enhanced CT are a dense delineation of a cortical vein known as the 'cord sign' and a hyperattenuating dural sinus known as the 'dense triangle sign'. These signs are usually subtle and easily overlooked. Changes in the brain parenchyma drained by thrombosed veins or sinuses are not obligatory and dependent on collateral venous capabilities. Changes can be vasogenic (congestive) or cytotoxic (ischemic) oedema in the cortices and subcortical white matter or frank haemorrhagic transformation.

CT venography with multiplanar reformatted (MPR) images has proved to be a reliable method to investigate the cerebral veins, with a reported sensitivity of 95% compared with digital subtraction angiography as the standard reference (4). Absence of enhancement of cerebral veins and dural sinus is the key to the diagnosis. The filling defect in a dural sinus is better known as the 'empty delta sign'. Other clues can be an asymmetrical distribution of superficial veins with so-called 'cork-screw collaterals' ipsilateral to the thrombosed veins or sinuses. CT venography is superior to MR venography in the identification of cerebral veins and dural sinuses and is at least equivalent in establishing the diagnosis of dural sinus thrombosis (5-7). Advantages of CT venography as compared with

MR venography are that it can be instantly performed as an adjunct to an unenhanced CT scan in patients undergoing the initial workup, easier patient monitoring and shorter examination time in critically ill patients, further its overall availability and last but not least its lower cost (4). Owing to its vascular detail and ease of interpretation, CT venography can provide a rapid and reliable diagnosis or exclusion of cerebral venous and dural sinus thrombosis as is demonstrated in our case. We are the first to report the findings of thrombosis of the left vein of Labbé on reformatted CT venography.

### Conclusion

Thrombosis of Labbé's vein associated with ipsilateral dural sinus thrombosis is rare. Findings on non-

enhanced CT in favour of the diagnosis are the 'cord sign' overlying the posterior aspect of the temporal lobe, the 'dens triangle sign' within the ipsilateral transverse and sigmoid sinus, gyral swelling with subcortical edema with or without hemorrhagic transformation. Diagnostic findings on multi-planar reformatted CT venography are the absence of enhancement of the Labbé's vein and ipsilateral transverse and sigmoid sinuses ('empty delta sign') and ipsilateral collateral veins.

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