Duret Hemorrhage

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• 76M patient presented to the ED with unconsciousness and fixed dilated pupils.

• According to the family, the patient was drowsy and difficult to arouse, which prompted them to call EMS. At the time EMS arrived, he was able to maintain his airway.

• En route to the ED, the patient was intubated and mechanically ventilated. His pupils were fixed.
• PmHx: CAD, CABG x3, A.Fib, Peripheral vascular disease. Recent staph aureus sepsis for which he was treated with antibiotics.

• Among his list of medications, he was being treated with dual anti-hypertensives as well as dalteparin.

• The available documented BP measurements were normal to low during his various hospital stay.
• Upon arrival and following relative stabilisation, a CT scan of the head was expediently arranged.
CT Head:
• The scan demonstrated a large left frontal parenchymal hemorrhage with a hematocrit effect. There is significant mass effect including:
  • 2.5cm midline shift
  • Left uncal herniation
  • Descending trans-tentorial herniation
  • Sulcal effacement
  • Effacement of the left lateral ventricle (that is slit like) with ballooning of the contralateral temporal horn.
  • Low lying cerebellar tonsils with fullness of the posterior fossa (images to follow)
• In addition to the parenchymal hemorrhage, there were areas of subarachnoid hemorrhage and extension into the ventricular system.
DDX:

• Given the appearance, location and hematocrit effect, the main differentials in this case were:
  • **Amyloid** (due to age and location of bleed)
  • **Anticoagulation** (hematocrit effect and hx of dalteparin use though the dose was not known)
  • Hypertension (less likely as the location is not typical and the patient was not hypertensive at the time of presentation)
  • Hemorrhagic transformation within a parenchymal mass (always a possibility but in this case no known history of malignancy)
There was a Pontine hematoma as well:
Duret Hemorrhage

• The pontine hematoma is called a Duret hemorrhage.

• This was first described by RL Duret in 1955.

• It represents a small, often single focus of acute hemorrhage within the center pons or medulla.
• The main etiology is believed to be shearing of branches of the basilar artery and/or draining veins within the brainstem following rapid increase in supra-tentorial pressure and development of descending tentorial herniation.

• The significance of this sign is that it is a marker of bad prognosis. It is usually seen in severe herniation approximately 12-24 hours prior to death.
DDX

The hallmark of Duret hemorrhage is that it is accompanied with a large supra-tentorial pathology causing severe mass effect.

In the absence of these two conditions, other diagnoses must be entertained, such as:

• Primary hypertensive hemorrhage within the pons
• Axonal brain injury affecting the pons
• Unfortunately, shortly after the scan, the patient passed away.
References

- Radiopaedia: [http://radiopaedia.org/articles/duret-haemorrhage](http://radiopaedia.org/articles/duret-haemorrhage)
- Statdx.com: intracranial herniation syndromes.