Cavernous Sinus Cavernous Hemangiomas

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33.1 Epidemiology and Clinical Presentation

- Cavernous sinus cavernous hemangiomas (CSCHs) are distinct from cavernous malformations (angiomas) [1].
- CSCHs are benign vascular tumors, not true vascular malformations; they frequently present with headaches and cranial nerve paresis [1, 2].
- Cavernous angiomas, on the other hand, are true vascular malformations that may be located anywhere in the brain. (*See* Chap. 61.)
- CSCHs comprise 2–3 % of cavernous sinus tumors.
- The mean age of patients with CSCHs is 43 years; there is female predilection [3].
- CSCHs occasionally may extend medially into the sella turcica and mimic pituitary adenomas [4–9].
- CSCHs represent 0.07 % of lesions treated in major transsphenoidal series [10].
- In rare cases, cavernous hemangiomas may arise in the sphenoid sinus, potentially resulting in visual deficits and headaches [11].

33.2 Imaging Features

- On MRI, CSCHs often show hypointensity or isointensity on T1-weighted imaging and hyperintensity on T2-weighted imaging (Fig. 33.1). Avid contrast enhancement is common in CSCHs [12, 13].
- On dynamic-enhancement MRI, CSCHs typically demonstrate heterogeneous contrast enhancement with initial enhancement [3].
- In angiographic studies, one third of CSCHs are occult; a blush in the cavernous sinus can be seen for the other two thirds [1].

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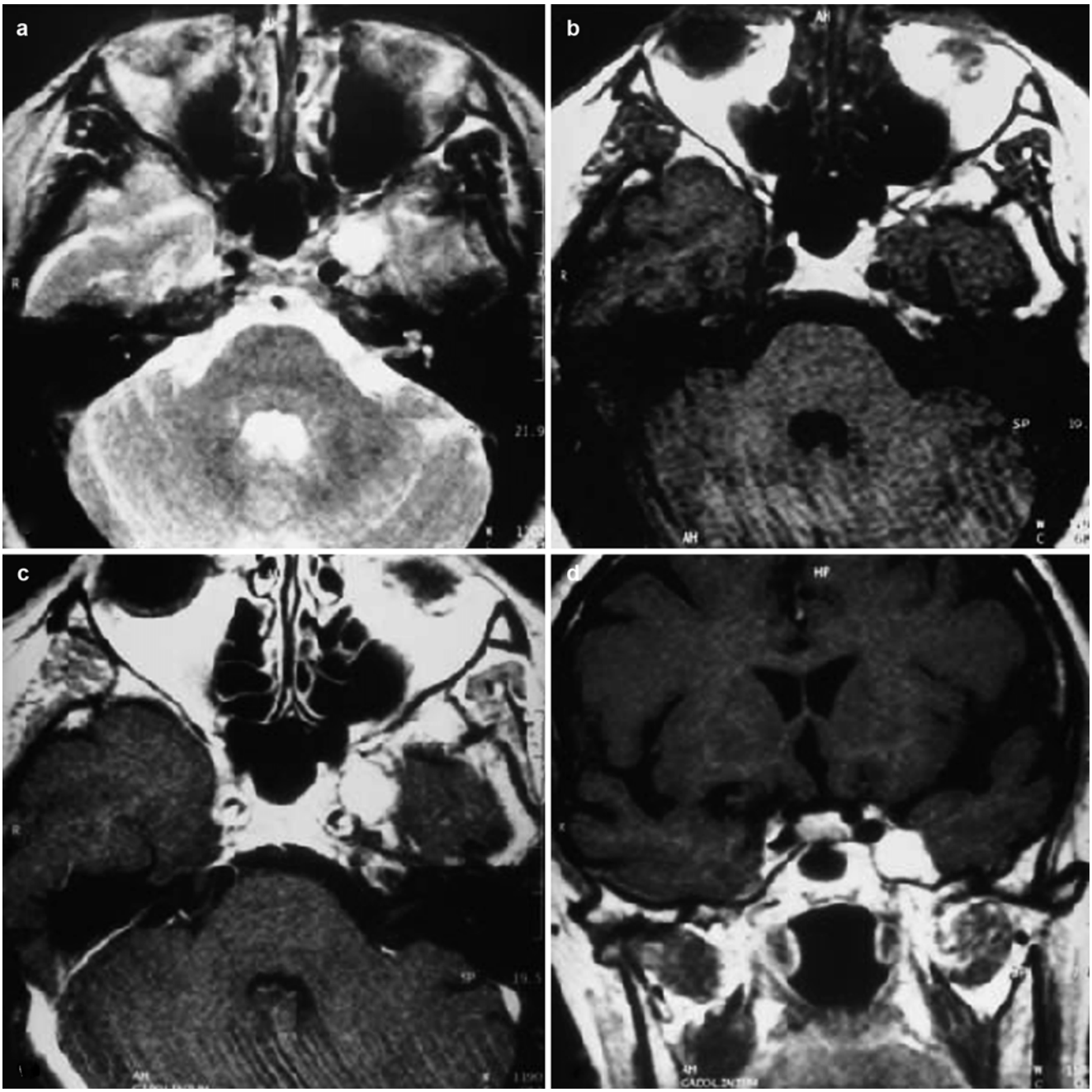

Fig. 33.1 Cavernous sinus cavernous hemangioma. (**a**) Axial T2-weighted MRI showing a rounded, hyperintense lesion in the left parasellar region and cavernous sinus. (**b**) Axial T1-weighted MRI shows the same lesion that is isointense to gray matter. (**c**, **d**) Axial and coronal contrast-enhanced T1-weighted MRI shows avid contrast enhancement of the left cavernous sinus hemangioma (adapted from Tannouri et al with permission, Neuroradiology. 2001;43:317–320)

33.3 Histopathology

- CSCHs are frequently lined by a pseudocapsule. Vascular channels are commonly seen, with intratumoral hemorrhage and calcification being rare findings in CSCHs (Fig. 33.2).
- CSCHs can be classified as one of two subtypes [14]:
  - Type A CSCHs are characterized by adjacent thin-walled, sinusoidal vessels with little intervening connective tissue. These CSCHs are associated with a high degree of intraoperative bleeding.
  - Type B CSCHs are characterized by more interconnective tissue and fewer sinusoidal vessels. These CSCHs are easier to resect surgically because they are associated with less bleeding.

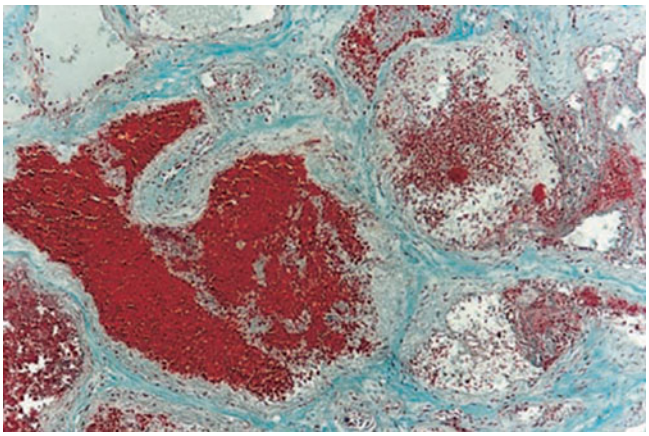

Fig. 33.2 Masson trichrome stain showing a cavernous hemangioma with compact, sclerotic vessels and little interstitium (adapted from Tannouri et al with permission, Neuroradiology. 2001;43:317–320)

33.4 Clinical and Surgical Management

- When necessary, surgical resection of a symptomatic cavernous sinus cavernous hemangioma may be performed via an endonasal endoscopic approach or craniotomy [4].
- The extradural temporopolar approach to the cavernous sinus is often utilized when open craniotomy is recommended [15].
- Injection of fibrin glue has been successfully used to control intraoperative bleeding during resection of CSCHs [16].
- Although recurrence rates are low following surgical resection via craniotomy, the incidence of cranial nerve paresis is rather high [2].
- As a less invasive alternative, stereotactic radiosurgery has been successfully and safely used to treat CSCHs. Tumor volume is decreased in up to 80 % of cases. The typical treatment dose is 13–14 Gy [12, 17, 18].

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