Craniopharyngioma surgery approaches

Approach selection is largely dependent on tumor location, extent of pathology, tumor consistency, relationship to the optic chiasm, relationship to the pituitary stalk, involvement of the third ventricle, history and details of prior surgeries, and lastly, the surgeon's preference based on personal experience and comfort. Various authors have classified craniopharyngiomas based on the location, their relationship to the pituitary stalk, or their position along the vertical hypophyseal axis

A variety of different skull base approaches can be used to access craniopharyngiomas, each with distinct advantages and limitations. Traditional open transcranial approaches include midline approaches (transbasal subfrontal and frontobasal interhemispheric), anterolateral approaches (pterional, orbitopterional, orbitozygomatic, frontolateral, and supraorbital eyebrow), and lateral approaches (combined petrosal and subtemporal).

Lateral supraorbital approach

Lateral supraorbital approach for Craniopharyngioma.

Interhemispheric approach

The minimally invasive anterior interhemispheric approach, with or without opening of the lamina terminalis is useful [1)].

Anterior interhemispheric approach

see Anterior interhemispheric approach

Purely intraventricular craniopharyngiomas situated in the third ventricle and/or lateral ventricles may be better accessed with transcortical or transcallosal interhemispheric approach intraventricular approaches.

Usually via large right frontotemporal flap as low as possible along base of frontal fossa (lateral sphenoid wing rongeured/drilled). Approach to tumor is extraaxial, whether subfrontal or frontotemporal. All tumors should be aspirated (even if they appear solid radiographically). Then, with microscope, possible approaches include:

1. subchiasmatic: through space between optic nerves and anterior to chiasm. It was thought that a "prefixed chiasm" (i.e. congenitally short optic nerves with chiasm unusually close to the planum sphenoidale) was more common in patients with CP, making this approach more difficult. However, in reality the chiasm is probably bowed anteriorly by the tumor within the third ventricle giving the illusion of a prefixed chiasm in most cases.

2. opticocarotid (between right ICA and right optic nerve/optic tract).

3. lamina terminalis (tumor often needs to be brought down and removed subchiasmatically).

4. lateral to internal carotid artery

5. transfrontal-transsphenoidal: drill off tuberculum sellae.

Alternative approaches to frontotemporal

1. pure transsphenoidal: if dark fluid is aspirated with no CSF evident, it is possible to leave a stent from the tumor cavity to the sphenoid air-sinus to permit continued drainage

2. transcallosal interhemispheric approach: strictly for tumors limited to the third ventricle

3. a combined subfrontal/pterional approach capitalizes on the advantages of each (head is positioned with slight lateral rotation)

Spare the following structures: small arterial feeders to undersurface of the chiasm (major supply) and tract; at least a remnant of pituitary stalk (recognized by unique pattern of longitudinal striations which are the long portal veins) of the Hypophyseal portal system. If the tumor easily pulls down from above then this is permissible, however do not pull too hard or else hypothalamic injury may result.

1)
Hori T, Kawamata T, Amano K, Aihara Y, Ono M, Miki N. Anterior interhemispheric approach for 100 tumors in and around the anterior third ventricle. Neurosurgery. 2010 Mar;66(3 Suppl Operative):65-74. doi: 10.1227/01.NEU.0000365550.84124.BB. PubMed PMID: 20173574.

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