Multi-Trajectory Surgical Approach Outcome In Treatment Of Pediatric Craniopharyngioma: Retrospective Cohort Study In 35 Cases.

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DISCLOSURE

• Nothing to disclose.
INTRODUCTION

- Craniopharyngioma is a challenging tumor of a benign origin which affect both adult and children. Despite it remediable nature, recurrence is still one of the main postoperative hindrance. The aim of conducting this study is to show how gross total resection in craniopharyngioma is amenable through designing a surgical management that allow multi-trajectory approach according to tumor characteristics with low profile surgical morbidity would affect the recurrence rate and quality of life.
METHODS

• Medical records from King Faisal Specialist Hospital were retrospectively reviewed of all cranipharyngioma pediatric patients were operated in neurosurgery department from 1997 to 2013 and 35 patients were selected. In addition to demographic, symptoms at presentation, endocrinological involvement, tumor characteristics and location, presence of hydrocephalus, previous treatments, various surgical approaches was used, resection extent, and recurrence were evaluated.
Result:

Male gender was significantly associated with a higher risk of recurrence in previous studies. In our study, male patients constitute 60% of total patients with no significant P value was found.

In term of clinical presentation in the literature only one study suggests significant correlation between initial visual field defect at presentation and patients outcomes. Our analysis showed no difference between visual field defect at presentation or normal visual field as predicting factor for recurrence.

Regarding tumor characteristics, 52.9 % of the tumors were cystic, and 38.2 % were mixed, 76% were sellar/suprasellar lesions, while third ventricle involvement was found in 58 % of the cases. In our study, we have chosen a diameter of 3.5 cm as our cutoff point. 75.9% of patients had a tumor with a maximum dimeter ≥ 3.5 cm while 24.1% of patients have less than < 3.5 cm, but the difference between two groups in term of recurrence was not significant.
Result:

As surgery is the mainstay of treatment of craniopharyngioma, which aim for tissue diagnosis, tumor resection as much as possible, and to open the CSF pathways.

Various surgical approaches are used for resection of craniopharyngioma and vary depending upon the location, extent, and projection of tumor.

The exposure we used is bifrontal-temporal craniotomy and subfrontal approach. This gives exposure to subfrontal, subtemporal, pterional, transsylvian, retrochiasmatic, and interhemispheric areas. This can give surgeons a wide intraoperative maneuverability.
Result:

We used bicoronal hairline incision, Superior sagittal sinus was ligated and divided it to facilitate the exposure, and by using the Microscope, Subfrontal approach is used to reach the cistern of the lamina terminalis. CSF is drained. Sylvian fissure is opened from medial to lateral side by opening the arachnoid. Olfactory tract, optic nerve, and internal carotid artery are identified. Tumor is approached through lamina terminalis, opticocarotid triangle, and space lateral to the internal carotid artery.

A plane of cleavage is developed around the tumor. Lumbar puncture needle with connecting tube is used to aspirate the contents of the cyst. Small opening is made and cavity of the tumor is entered. Contents of the tumor are aspirated with suction. If the contents are solid, CUSA is used to resect the contents.

Cyst wall is removed either in total or piecemeal. If the tumor is adherent to the hypothalamus, we leave the tumor not to damage the hypothalamus. At the end of dissection, we secure the hemostasis. Field is thoroughly irrigated with saline. We use topical papaverine if there is suspicion of vasospasm of the vessels. Dura is closed. Bone flap is fixed back with matrix plates and screws.
Result:

Many articles in the literature have confirmed incomplete tumor resection as an important risk factor of craniopharyngioma recurrence.

In our study, Rate of disease recurrence defined as evidence of tumor growth on neuroimaging with or without clinical symptoms was 42.9%, seen in 15 patients, leading to 10-year disease free-survival of 0.633 ± 0.085 (Fig.1).

It might be due to few number of subjects in our study that we could not find any significant correlation between recurrence and extent of resection. Nonetheless, our surgical approach described before can succeed in gross total resection in 70.6% of cases compared with the average in multiple previous studies which was = 59.3%.
Discussion:

Gross total resection (GTR) was achieved in 70.6% of patients through using combined multi-trajectory approach in 51%, Pterional approach in 24.2%, and frontal approach in 24.2%.

By using those approaches -Described before- no morbidity was added. However, thirty-three patient continued to have panhypopituitarism and needed replacement as preoperatively and visual deficit was unchanged from baseline in 19 patients. Where cognitive deficit was reported after surgery in two patients only.

However, It might be due to few number of subjects in the study that no significant correlation was found between the extent of the resection and the surgical approaches as well as the recurrence rate.
SUMMARY POINTS:

• Gross total resection in craniopharyngioma is amenable through designing a surgical management that allow multi-trajectory approach according to tumor characteristic with low profile surgical morbidity.

• It might be due to few number of subjects in our study that we could not find any significant correlation between recurrence and extent of resection. However, our surgical approach described before can succeed in gross total resection in 70.6% of cases compared with the average in multiple previous studies which was = 59.3%, leading to 10-year disease free-survival of 0.633 ± 0.085, with no added morbidity.