

Pituitary Tumor Surgery in B & B Hospital

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Received, 15 November, 2017

Accepted, 15 December, 2017

Pituitary adenoma is a common brain tumor and pituitary tumor surgery is a High-tech neurosurgical procedure. Evaluation of a patient with pituitary tumor is a complex process as it requires different modalities. Accordingly planning its management including decision making whether to do surgery or not is also a difficult task. At the same time surgical management of pituitary tumor is not an easy job. Moreover, pituitary surgery demands various tools and equipment in addition to sharp neurosurgical skill.

BB hospital is one of the few centers in the whole country where pituitary surgery is being done regularly with excellent outcome. In this regard, here we present our experience of pituitary surgery in the last one and a half years.

Keywords: B&B Hospital, pituitary adenoma, pituitary surgery.

Pituitary tumors are common brain tumors, they fall in most common brain tumors after glioma and meningioma.¹ Acoustic schwannoma has almost the same incidence as that of pituitary tumors. Asymptomatic pituitary tumors are even more common occurring in one in about 20-25 normal persons. Therefore pituitary tumor surgery is an important neurosurgical procedure in any standard hospital where neurosurgical facility is available. However, since many patients have asymptomatic pituitary

adenoma, not many patients go for the proper neurosurgical management. Moreover, due to lack of hospitals where surgical facility for pituitary tumors is available, patients can't reach the proper center for treatment. In the Nepalese context there are hardly few centers where pituitary tumors can be well managed.

B&B Hospital is one of the biggest private hospitals with multidisciplinary medical services in Nepal. Despite its long history with neurosurgical service, it seems pituitary tumor surgery was not a common

procedure in the past. However, recently pituitary tumor surgery has become a routine procedure in this hospital and thus now B&B Hospital has been recognized as one of those few hospitals in Nepal where pituitary surgery is regularly performed.

Materials and Methods

This is a retrospective analytical study of pituitary tumors in B&B Hospital from early 2016 till late 2017. All together 5 cases of pituitary tumors were operated in this period. Thorough retrospective analysis of all the cases has been done. Clinical information was obtained from the record keeping section of the hospital and informed consents were taken from all the patients at the time of admission for future study without disclosing their personal details. The follow up period is 6-20 months.

Results

All the five patients were females with macro-adenoma of pituitary gland ie size of tumor being more than 10 mm. The age of the cases ranged from 35 to 57 years. Three of them were non-functioning tumors with mass effect on the optic chaisma and remaining two were prolactinomas. All the patients were symptomatic since few years before coming to our hospital. Surgery was performed on the basis of their MRI findings and the symptoms. One of the non-functioning adenoma was a recurrent case which was operated by the author himself about 3 years ago in another hospital.

Surgical procedure

Patients were well explained about the disease and its possible consequences in future if not treated properly. They were also well informed about surgical procedure and its possible adverse effects. All the patients were operated via Endonasal Trans-Sphenoidal approach. Patient was put in supine position with head elevation of about 20 degree after general anesthesia. Patients' oropharynx was tightly packed with ribbon gauze, after endotracheal intubation, soaked in antiseptic ointment so that there is no trickling of blood in the respiratory tract during surgery. Patients' nasal and oral cavity was thoroughly cleaned with Betadine solution. Local anesthesia was injected in the submucosal layer of bilateral nostrils and nasal cavities. Small incision was given in the nasal mucosa in right nasal cavity at the junction of vomer bone and cartilage of nasal septum. The junction of bone and cartilage is broken and base of vomer bone is completely exposed by pushing cartilage to left side with the help of nasal speculum. Hardy's speculum was used for this purpose. Vomer bone was broken and sphenoid sinus was opened. Mark X-ray was taken to confirm the exact anatomical location. All the mucosal layer of sphenoid sinus was taken out and the cavity was thoroughly cleaned and irrigated. Sella tursica was opened and pituitary dura was exposed all around. Again mark X-ray was taken before opening dura. Dura was opened and tumor was exposed which was

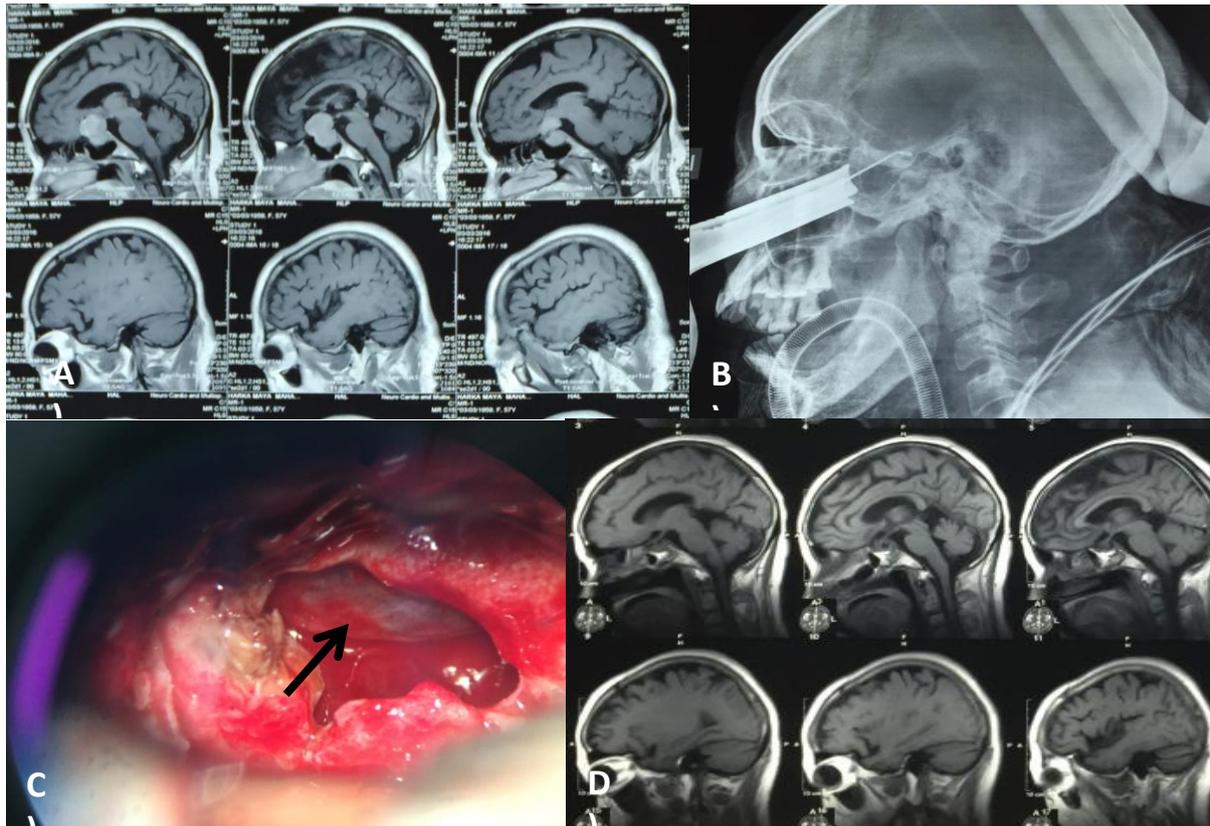


Figure 1: A case of pituitary adenoma, A) pre-operative MRI T1W with contrast showing pituitary adenoma, B) intra-operative X Ray showing marking of sphenoid sinus, C) intra-operative picture showing total tumor removed and diaphragm sella seen (arrow), D) post-operative MRI T1W showing complete removal of tumor

soft in all the cases. Tumor was removed with the help of ring curettes and suction. After thorough removal of the tumor, arachnoid layer of diaphragma sella was exposed which indicates complete removal of the tumor. No cerebrospinal fluid (CSF) leak was noticed in any of the cases.

Patient was observed in the ICU on the day of surgery and was shifted to general ward next day. Nasal pack was removed on the third day and patient was discharged on 5-6 days after surgery. There were no surgery related complications. No signs of infection, diabetes insipidus (DI), electrolyte imbalance etc. Post-operative CT scan was taken on the second or 3rd day

of surgery which showed complete removal of the tumor.

Patient was followed after 1 week, 1 month and 6 months after surgery.

Discussion

Pituitary tumor is common in Nepal as well. Due to ignorance, lack of hospitals with pituitary surgery service and financial reason not many patients are being able to go for the surgical treatment in Nepalese context.

Cushing and Dandy were the pioneer in the field of diagnosis and treatment of pituitary tumors. Cushing developed early concept of pituitary gland and its pathology and Dandy

further enhanced the concept and surgical technique of pituitary surgery, mainly the transcranial approach for the pituitary tumor.²

During surgery of pituitary tumor, the hypothalamic pituitary adrenal axis gets activated and thus there is excess secretion of ACTH and thus cortisol which at time my inversely affect the human physiological system. To counteract this excess cortisol secretion, preoperative administration of high dose of dexamethasone has been of used. However, studies have shown that even high dose of dexamethasone, single dose or repeated dose, doesn't affect the cortisol secretion during surgery.³ In our practice, we never use dexamethasone before and after surgery until and unless there are signs of hypocortisolism.

Zhao Y et al have analyzed their experience in elderly patients of pituitary tumors. They have found females and non-functioning tumors to be more common.⁴ Similarly they had cases with recurrence. We had the same findings as theirs. All the cases were females in our cases. We also re-operated in the case of recurrence after which total resection was achieved. However, we haven't sent the case for radiotherapy as radiotherapy for pituitary tumor in Nepal is not that good and there was total resection after second surgery.

Endoscopy is an important technique in the surgery of pituitary tumor as mentioned by Anik L et al., Gondim JA.^{5,6} Endoscope helps to see almost all the corners of the pituitary fossa especially the cavernous sinus area if invaded by the tumor which is

not possible by only microscope. We operated all the cases under microscope only as we don't have neuro-endoscope system in our hospital. Pituitary tumor can be operated more radically with the help of endoscope.

Moreover, in our cases cavernous invasion was not there, so we didn't need endoscope in our cases mentioned in this study.

Trans-sphenoid approach is the best approach for most of the lesions in sellar region.⁷ By this approach, lesions with parasellar and suprasellar extension can also be removed safely using microscope and endoscope. We use the same approach through endonasal route for all the pituitary lesions as far as possible. We have not a single experience of operating such cases trans-cranially or sublabially.

In Nepal, So far there is nothing like pituitary tumor center. Several hospitals in Kathmandu city have good facility for this, however, there is no collaboration among these centers. In some parts of the world there are pituitary tumor centers established with the goal of providing the best treatment including surgical, palliative and conservative.⁸ They fulfill certain criteria and make a team for above mentioned objectives to make a proper center. It will be definitely better to have such center in Nepal too.

Endocrinologist can play a good role in the management of pituitary lesions in collaboration with neurosurgeons. Hyperprolactinemia, acromegaly, hypo or hyperpituitarism etc are well managed by the joint effort as suggested by Niculescu DA et al.⁹ in our practice, we do seek help

of endocrinologists if needed.

Regarding the surgical complications of pituitary surgery, CSF leak is one of the common complications as suggested by Zhang C et al.¹⁰ We do have such complications in our experience especially in early days of our practice. However, it's getting uncommon with our better experience. We try not to injury arachnoid layer of diaphragm sella by pushing the layer above rather than pulling while sucking the tumor. We often use autologous fat graft along with fibrin glue to prevent CSF leak. If at all there is CSF leak, lumbar drain of CSF for about a week is the best to control it.

Similarly DI is another common post-operative complication which is also getting less in our experience.

At times, pituitary hyperplasia can be confusing with pituitary adenoma. Sansone A et al have found a case of pituitary hyperplasia due to thyroxin malabsorption and hypothyroidism.¹¹ We had a similar case experience operated few years ago in another hospital which is not included in this study. Significant tumor removal was done leaving the rest of the mass behind but biopsy revealed normal pituitary/ brain tissue. Post-operative CT scan showed residual mass. However that patient didn't have pre or post-operative hypothyroidism and couldn't be evaluated further.

Conclusion

Pituitary tumor surgery is one of the High-tech neurosurgical procedure which is not common in many hospitals in Kathmandu, Nepal. B & B Hospital has been regularly

providing this service since few years back with excellent outcome.

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