

## Implantation Meningioma of Scalp: An Unusual Iatrogenic Complication Following Excision of Benign Intracranial Meningioma

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**Received,** 7 October, 2013

**Accepted,** 23 October, 2013

Meningiomas are one of the common benign intracranial neoplasms. Incidence of extra cranial meningiomas is rare and can occur up to 1-2 % of meningiomas.<sup>1,3,4,5,7,9,10</sup> Majority of these lesions were primary scalp meningiomas.<sup>2, 8, 9</sup> Seeding of meningiomas along the surgical trajectory are extremely rare, and there are only two case reports of malignant meningioma developing at the operative wound following excision of malignant intracranial meningioma.<sup>4, 7</sup> There are no reported incidences of a benign meningioma seeding to the scalp. Author report a case of benign meningioma developed in the scalp flap, two years following the complete excision of an intracranial benign meningothelial meningioma.

### Case Report

Twenty five years gentleman presented to the author with a right frontal scalp swelling ten months back. The scalp nodule slowly increased in size and was associated

Intracranial meningiomas constitute about 18-20% of all intracranial neoplasms. Most of them are benign in nature. Very few cases are malignant and they locally aggressive. About 1-2% of meningiomas are extra cranial meningiomas and they are commonly seen in spinal, facial and scalp regions. Most of these are primary extra cranial meningiomas. There are few reported cases of malignant meningioma metastasizing to the operative field due to tumor cell contamination. No such report of tumor contamination or metastasis was reported with benign meningioma in the literature.

Author report a case of scalp meningioma developed in the skin flap used during the previous surgery for right benign meningothelial meningioma excision. Possible mechanism of development of extra cranial meningiomas was discussed.

**Key Words:** meningioma, metastasis, neoplasm, scalp meningioma

with minimal local pain. Patient underwent right frontal intra cranial meningioma excision (**Figure 1**) at another hospital two years before he reported to the author. It was a complete excision and the recent follow up brain scan did not show obvious residual or recurrent intracranial tumor. One year following the first surgery, patient noticed a small scalp swelling in the location of previous operation. It was gradually increasing in size.

On examination, the lesion located in the right frontal scalp flap used for the previous surgery. It was firm in consistency, not fixed to the underlying skull bone. It was non-tender and not having any pulsations. The scalp surface over the lesion was smooth without evidence of inflammatory changes and there were no evidence of regional lymphadenopathy. On evaluation with the contrast enhanced computed tomography (CECT) brain (**Figure 2**), it revealed a contrast enhancing subcutaneous scalp lesion. There was no evidence of enhancing intra cranial lesion suggesting residual or recurrent intracranial meningioma. Skull bone underneath the scalp lesions

Discussion

Meningiomas are one of the common intracranial tumors and account for nearly 18-20% all intracranial neoplasms. They usually arise from the arachnoid cap cells.<sup>6</sup> Nearly, 90% of these lesions are either benign or locally aggressive in nature. Very few cases have malignant potential causing recurrence of the lesions or metastasis to the adjacent structures.<sup>6, 10</sup> The incidence of extra cranial meningiomas are extremely rare and 1-2% total meningiomas are extra cranial in nature.<sup>5</sup> Common mechanisms for the extra cranial meningiomas are<sup>6</sup>

- a) Primary intracranial meningioma with extra cranial extension
- b) From arachnoid rest cells, accompanying cranial nerve sheaths
- c) From extra cranial embryonic arachnoid cell rests
- d) Metastasis from intracranial meningiomas

Metastasis from intracranial meningioma is usually from the malignant meningiomas. Various types of cell dissemination from these lesions are: hematogenic, lymphogenic, CSF dissemination or by iatrogenic.<sup>4</sup> There are only two case reports, which suggest that the operative site spill over of the tumor cells led to development of extra cranial meningioma.<sup>4, 7</sup> Both these cases are metastasized from malignant meningiomas. Ludeman<sup>4</sup> reported a case of 11 years child who developed an extra cranial meningioma following the excision of intracranial meningioma. The scalp meningioma involved the skull bone and extended on either side of bone involving the scalp as well as frontal brain matter. This case is more of local dissemination rather than metastasis. Only other case of abdominal wound dissemination was reported



Figure 1: Contrast enhanced computed tomography (CECT) axial image of the brain taken before the first surgery, showing brightly enhancing lobulated, dural-based right frontal mass with perilesional edema.

appeared normal without obvious bone infiltration or periosteal reaction.

Tumor removed through the previous scalp incision. There was clear plane of cleavage in the subcutaneous tissue all along the tumor. Pericranium was intact and total tumor removal could be achieved.

Histopathological examination confirmed it as WHO (World health organization) grade 1 meningothelial meningioma. Histopathological examinations of both intracranial meningioma and scalp tumor demonstrated similar pathological features (Figure 3).

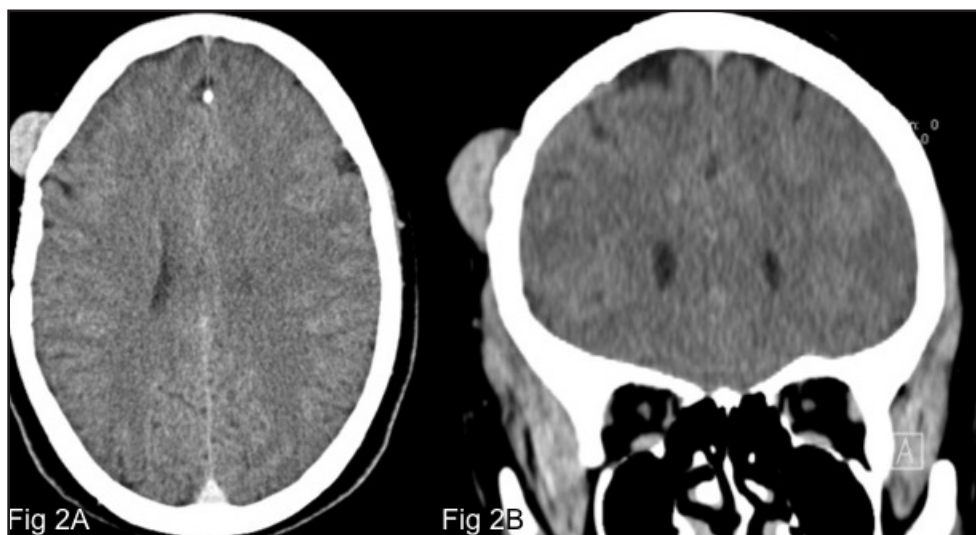


Figure 2: Contrast enhanced computed tomography (CECT) axial (2A) and Coronal (2B) image of the brain taken before the second surgery, showing nodular scalp lesion over the bone flap used during the first surgery.

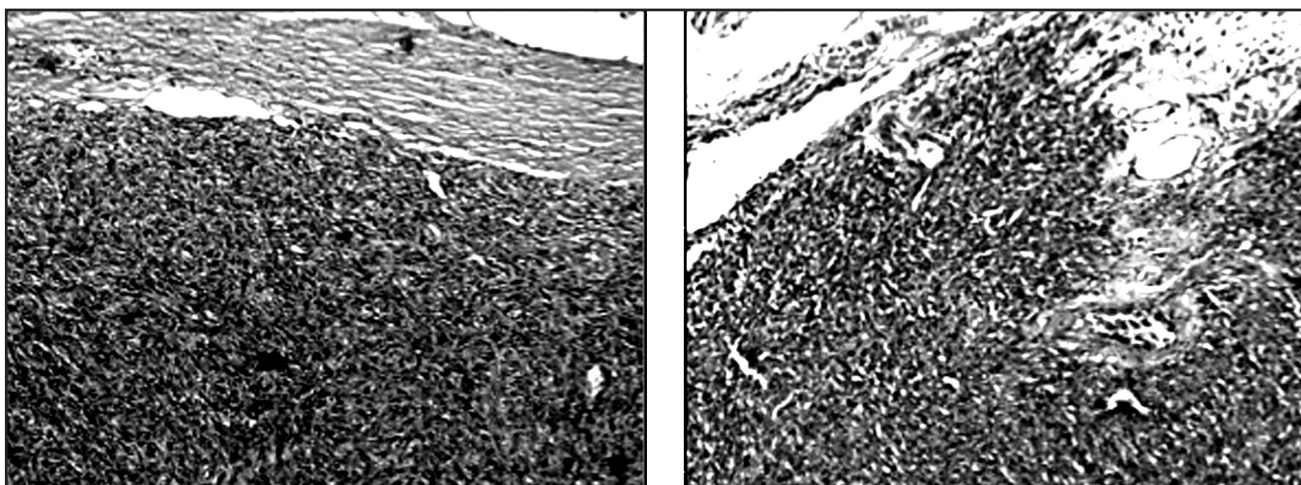


Figure 3: Histopathological examination micro photographs of H & E stained slides (10x) of intracranial tumor along with dural attachment (3A) and scalp lesion along with surrounding fibrous covering (3B) showing the typical features of meningothelial meningioma.

by Sadahira et al.<sup>7</sup> The dissemination to abdominal wall occurred due to contamination following while harvesting the fat graft.

The present case is a benign WHO grade 1 meningothelial meningioma of scalp. Patient reported to the author with a scalp nodule. On evaluation, the patient harbored an intracranial meningioma two years back and he underwent excision of meningioma at a different organization. With the provisional diagnosis of the scalp meningioma, author operated scalp tumor through the previous operative scar. The tumor was located in subcutaneous space and pericranium was intact. The tumor infiltrated neither skull bone nor the scalp.

To the best of author's knowledge, there was no such case reported in the English literature. The possible mechanism of this unusual entity might be because of a small bit of tumor tissue implanted accidentally during the first surgery.

### Conclusions

This case demonstrated that even the benign meningioma have the potential to grow in surgical field if contaminated with tumor tissue. One has to be careful not to spill any kind of tumor tissue near operative field and proper cleaning can prevent this kind of iatrogenic complications.

### References

1. Baek BJ, Shin JM, Lee CK, Lee JH, Lee KH. Atypical primary meningioma in the nasal septum with malignant transformation and distant metastasis. *BMC cancer* 12:275, 2012
2. Brown JM, Cherry AP. Subcutaneous meningioma. *Med J Aust* 2(21):1072-1073, 1971
3. Hussein MR, Abdelwahed AR. Primary cutaneous meningioma of the scalp: a case report and review of literature. *J Cutan Pathol* 34 (Suppl 1):26-28, 2007
4. Ludemann WO, Obler R, Tatagiba M, Samii M. Seeding of malignant meningioma along a surgical trajectory on the scalp. Case report and review of the literature. *J Neurosurg* 97(3):683-686, 2002
5. Nadarajan V, Goddin J, Luder D, Doshi A. An unusual bump on the head. Intraextracranial meningioma presenting incidentally. *BMJ Case Rep Jun* 28, 2012.
6. Neeff M, Baysal E, Homer J, Gillespie J, Ramsden R. Intracranial/Extracranial meningioma arising in the hypoglossal canal: case report. *Skull base* 17(5):325-330, 2007
7. Sadahira Y, Sugihara K, Manabe T. Iatrogenic implantation of malignant meningioma to the abdominal wall. *Virchows Arch* 438(3):316-318, 2001
8. Serwatka LM, Mellette JR. Cutaneous meningioma. *J Dermatol Surg Oncol* 10(11):896-900, 1984
9. Theaker JM, Fleming KA. Meningioma of the scalp: a case report with immunohistological features. *J Cutan Pathol* 14(1):49-53, 1987
10. Whicker JH, Devine KD, MacCarty CS. Diagnostic and therapeutic problems in extracranial meningiomas. *Am J Surg* 126(4):452-457, 1973