Frontal Sinus Carcinoma

By Ivor Frew (Newcastle upon Tyne)

This is a very rare disease and receives little mention in text books. Nevertheless, it causes great pain and distress to the patient and presents difficulties in management for the doctor.

Between 1955 and 1967 I have traced 6 cases of primary carcinoma of the frontal sinus which have been treated in the Newcastle Regional Radiotherapy Centre. Histology was available in all cases and showed a squamous celled carcinoma, all well differentiated in type.

Symptoms

Localized frontal headache and swelling over the affected sinus were the presenting symptoms in 4 cases. The pain was severe and unremitting, rarely alleviated by ordinary analgesics. Invasion of the orbit produced diplopia, and eventual limitation of eye movements.

All 6 cases showed radiological evidence of bone destruction around the involved sinus. Unfortunately, in most cases there was nothing radiological which would differentiate an infection such as a pyocele from a more sinister lesion. Diagnosis was only confirmed by opening the sinus and obtaining a biopsy.

Two cases which were transferred to my department for further investigation and treatment illustrate some of the difficulties of early diagnosis.

Case reports

Case No. 1.

A female aged 48 years was admitted to the Neuro-surgical Department on 2 September 1966. Her complaints were of headache and diplopia. The former had started 10 weeks previously in the occipital region and then gradually radiating forwards to the frontal region on both sides. Two weeks later she developed diplopia.

Her headache increased, and, on admission, she was in great distress. Clinical examination showed slight proptosis of the right eye with almost complete limitation of eye movements, and bilateral papilloedema.

On 3 September 1966, an E.E.G. showed changes indicating a severe generalized disorder together with evidence of a deep seated left anterior lesion.

Bilateral carotid angiography on 6 September 1966 showed: "although the internal cerebral vein lies in the mid-line, the lateral view shows the venous angle to be displaced backwards and downwards (Fig. 1). The appearances, although by no means definite, suggest the possibility of a bilateral frontal space occupying effect." (Fig. 1).

On 12 September 1966, further skull X-ray confirmed the presence of bone destruction in the inner part of the right orbit extending through the

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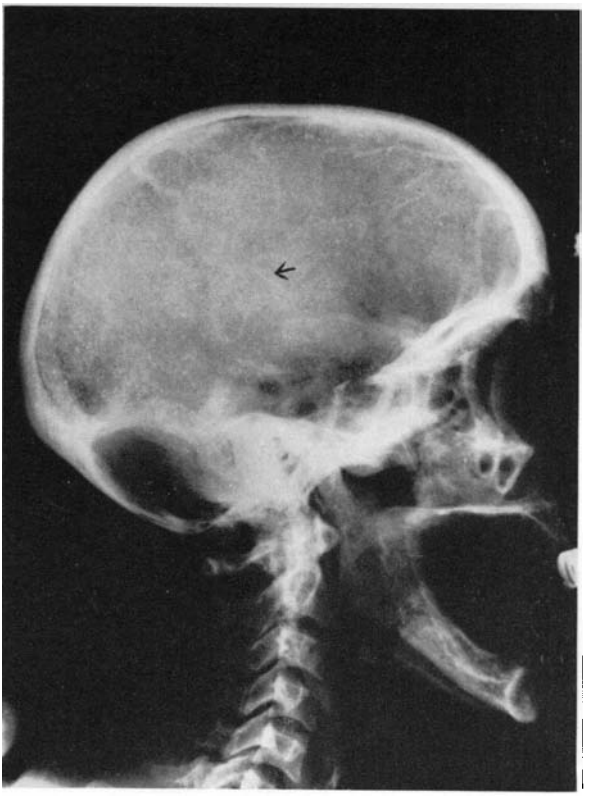


FIG. 1.
Bilateral carotid angiogram suggesting frontal space occupying lesion.

dividing wall of the frontal sinuses. "There is a soft tissue swelling in the lateral part of the right frontal sinus. Suggested diagnosis, either a mucocele of the frontal sinuses or an early malignant tumour arising from the mucous membrane of the frontal sinuses" (Fig. 2).

I saw her on 14 September 1966. Examination of the nose, post-nasal space and throat was negative. There was no palpable swelling over the region of the right frontal sinus.

Exploration of the right side was obviously indicated, and the patient was submitted to operation on 15 September 1966. Opening the frontal sinus showed an extensive neoplasm involving both frontal sinuses and entering the right orbit. The backward extension through the posterior wall could easily be demonstrated and as much tumour as possible was removed. The incision was closed with intra-nasal drainage.

Histology showed a well differentiated squamous cell carcinoma, and a course of megavoltage therapy was instituted on 22 September 1966. By 6 October 1966, her condition was much better, headache being less severe, and slight right eye movement was possible, although the double vision still persisted. On completion of the course of 4,000 r, the patient was ambulant,

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FIG. 2.
X-ray showing soft tissue swelling in right frontal sinus.

free from headache, and feeling much better. She went home on 20 October 1966.

Unfortunately this improvement was of short duration. The headaches recurred, she became blind, and died on 26 February 1967 with extensive recurrence of the tumour.

Case No. 2.

A female aged 66 years was referred to a medical department on 10 November 1965. She had noticed a swelling above the middle of the right orbit, for the past 2 months. This was associated with severe throbbing pain, but no actual visual involvement. X-ray of skull on 18 November 1965 "showed an area of frontal bone destruction to the right of the mid-line, probably a carcinomatous deposit, although no evidence of a primary could be seen on chest X-ray".

Biopsy of the lump was carried out on 20 January 1966. The histology demonstrated a well differentiated squamous cell carcinoma probably of local origin.

She now had considerable pain over the right frontal sinus and I was asked to explore the sinus. Operation on 8 March 1966 showed no exterior erosion of the sinus, but nevertheless it was found to be full of neoplasm, the only extension being through the lateral wall, accounting for the original lump. As

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much tumour as possible was removed and the wound closed with intranasal drainage.

A course of megavoltage therapy was commenced up to a total dose of 4,000 r. The immediate response was good. Her headache improved, the swelling disappeared and she remained ambulant and in reasonable health for 6 months. Then the tumour recurred and she died on 3 November 1966.

This patient was very difficult to manage and the time lapse between biopsy and treatment being instituted was due to the reluctance of the lady to accept any form of treatment initially, despite being aware of the serious nature of her complaint.

Treatment

All 6 cases were treated with megavoltage therapy, the average tumour dose being 4,000 r. Although the initial response was good, with relief of headache and sometimes return of eye movements, if the orbit was involved the improvement was usually of short duration.

Recurrence was rapid and the survival times are shown below. The time is measured from the date they first attended hospital.

Sex	*Age*	*Survival*
Male	54 years	14 months
Female	74 years	11 months
Male	38 years	27 months
Female	48 years	5 months
Female	66 years	12 months
Male	68 years	16 months

Discussion

Obviously early diagnosis is important. Unfortunately, a neoplasm is seldom suspected until the illness has been present for several months. This being so, and judging by the poor long-term response to megavoltage therapy, I would suggest that arterial perfusion might help. It could be of value to carry out internal carotid perfusion with methotrexate, or vincristine at the same time as the radiotherapy. Otherwise I am sure that such arterial perfusion would considerably alleviate pain in those cases which recur. Such a procedure would be of great advantage in keeping the patient ambulant while free from pain. The only alternative being to keep the patient in bed under heavy sedation.

Acknowledgments

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