Ten Years’ Experience with Radical Combined Craniofacial Resection of Malignant Tumors of the Paranasal Sinuses


Branch of Surgical Neurology, National Institute of Neurological Diseases and Blindness, and Surgery Branch, National Cancer Institute, National Institutes of Health, U. S. Public Health Service, Department of Health, Education and Welfare, Bethesda, Maryland

Malignant tumors of the paranasal sinuses account for but a small percentage of human neoplastic disease. This amounts to about 3% of all cancer of the upper respiratory and alimentary tracts or approximately 0.2% of all human cancers. Watson found an incidence of 0.44% of cancer of the paranasal sinuses in a total of 26,062 patients admitted for malignant disease at Memorial Hospital. Nevertheless, serious study of these patients is merited not only because of the peculiarly unpleasant suffering these patients undergo in the terminal period but because it has been found practical to eradicate the disease in a relatively high proportion of patients. It should be re-emphasized that only historically malignant tumors are under present consideration.

From a statistical point of view, several features suggest that radical therapy should provide a high cure rate. Some 80% of tumors of the paranasal sinuses are estimated to arise in the maxillary sinus which has long been considered a surgically accessible site. The tumors, appearing as they most commonly do in the fifth to seventh decade, are predominantly carcinomas or adenocarcinomas and frequently of slow-growing type. Certainly one of the greatest difficulties in treatment is diagnosis of the tumor in an early stage. Often, many months of symptomatic treatment is prescribed for the protean symptoms of nasal obstruction, local pain, and epistaxis before a definitive diagnosis of malignancy is made. Despite the late diagnosis, metastases are relatively uncommon. Of 68 patients with cancer of the nasal cavity, MacComb and Martin found that 12% had metastases on admission and only 17% had metastases later in their course. This incidence is approximately the same as that of Ashley and Schwartz who noted at autopsy that only 25% of maxillary carcinomas spread beyond the local area. Metastases usually appeared in the retropharyngeal and superior cervical lymph nodes if the primary tumor was in the superior and medial portion of the antrum. Tumors involving the floor and lateral wall were more prone to show metastases in the submandibular lymph nodes. Taken together, these features encourage surgical attack upon the local lesion.

Unfortunately, hopes of an en bloc resection through a facial approach can only be realized in the cases with very small lesions, since tumors, even if primary in the antrum, seldom remain there. The common extension of tumor into the ethmoidal sinus and the impossibility of removing this sinus en bloc through a facial approach is a particular deterrent to resection, since even as late as 1963, Frazell and Lewis warned that “the entire cribriform plate can rarely be resected without creating cerebral complications. . . .”

Faced with these doubts and in hopes at least of palliation with a low incidence of morbidity, many physicians have applied x-ray therapy with considerable vigor. Some, indeed, consider x-ray to be the preferred method of treatment. Five-year survival rates of 30% and 40% have been quoted for either external radiation or intratumor radium implantation. In view of the slow-growing nature of these tumors and the impossibility of actually accurately assessing the topographical spread of the tumor, these gross survival rates may mean less than they would appear to at first glance. Despite the fact that surgery is not involved, the incidence of complications following primary radiation is significant. Gibb indicates that bone necrosis and sequestration is to be expected, and thus secondary surgical drainage is required. Others point out the difficulty in adjusting high external x-ray dosage to the irregular

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shape of the paranasal sinuses. Most reports mention difficulties such as empyema, panophthalma, radiation cataract, and long periods of drainage and sequestration.

Dandy's\textsuperscript{3} surgical approach to orbital tumors pointed out the feasibility of surgical attack on the basal skull area; his approach has been modified and extended by Tym,\textsuperscript{17} Malecki,\textsuperscript{12} and Pool, \textit{et al.},\textsuperscript{14} to surgery of the frontal and paranasal sinuses. The feasibility of the routine combined craniofacial en bloc resection was demonstrated here by Smith, \textit{et al.}\textsuperscript{10} The procedure was reviewed primarily from the maxillo-facial aspects in 1963.\textsuperscript{9} The present report has been prepared to present refinements in the neurosurgical technique and to bring to the attention of neurosurgeons, more generally, the advisability of collaboration with their maxillo-facial colleagues in the radical treatment of malignancies of the paranasal sinuses.

**Patient Material**

The combined procedure was carried out on 32 individuals (15 females and 17 males). Of these, 19 had carcinomas (16 to 75 years of age, with only two under 50 years, for a mean age of 56 years); and 10 patients had sarcomas (6 to 70 years of age, with only three over 50 years, for a mean age of 30 years). Three patients were eliminated from the study (two died and one was lost to follow-up). Seventeen patients had received no definitive treatment other than biopsy through the nose or a Caldwell-Luc approach. Fifteen of the patients had had extensive surgical procedures with or without subsequent radiation.*

Patients who had distant metastases or evident involvement of the central nervous system were eliminated from consideration.

In evaluating the extent of the cranial disease, particular reliance has been placed upon tomography,\textsuperscript{6} which is currently carried out in the transverse and sagittal planes. In addition, stereoscopic Water's anterior, posterior, and lateral x-ray views were taken. Cases were refused which showed invasion of the sphenopalatine fossa as evidenced by erosion of the pterygoid plates. Failure to visualize the poste-

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* It may be noted that in the 15 previously treated patients, only 4 have been followed over 20 months after our procedure without evidence of recurrence; whereas, in 17 patients sent in more promptly, 8 have been followed over 20 months without evidence of recurrence.