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Tumors of the paranasal sinuses and the nose - A retrospective study in 136 patients

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SUMMARY

In a retrospective study 136 patients with neoplasms of the paranasal sinuses had been analysed. Survival was plotted against localization, TNM-grading, histology, treatment modalities, and various other parameters. Treatment of choice seems to be radical surgery and postoperative high voltage irradiation.

INTRODUCTION

The treatment of tumors of the paranasal sinuses has evolved through many stages. Most authors nowadays have concluded that a combination of irradiation and surgery offers the best chance for cure (Cheng and Wang, 1977; Ketcham et al., 1973; Lewin and Castro, 1972; Sission, 1970; Weymuller et al., 1980; Wustrow, 1976). There is still controversy regarding (1) the role of radical ablative surgery and (2) the timing of radiotherapy. This was the incitement to present this series.

MATERIAL

In a retrospective study 136 patients with tumors of the paranasal sinuses and the nose have been analysed (mean age: 64 yrs male, 52 yrs female). Most tumors occured between the 4th and 5th decade, carcinomas between the 5th and 7th decade, sarcomas either early (until the 3rd decade) of late in the 7th decade. 41.9% of the tumors were squamous cell carcinomas, 7.4% adenocarcinomas, 12.5% transitional cell carcinomas, 4.4% adenoid cystic carcinomas, 15.4% sarcomas, and 18.4% various other tumors. 27.9% of the tumors occured in the upper level (ethmoid complex, sphenoid- and frontal sinus), 53.6% in the maxillary sinus, 17% in the nose, and 1.5% in the lower level. Squamous cell carcinomas and sarcomas were more numerous in the antrum.

Treatment included five therapeutic categories: Surgery alone (n = 22), surgery and postoperative high voltage irradiation with 60 Gy applied locally and to the neck (n = 64), high voltage irradiation alone (n = 20), surgery, irradiation and

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chemotherapy (Vincristin and Cyclophosphamid) (n = 12), and no therapy at all on patients' request (n = 11).

RESULTS

Tumors of the ethmoid complex originated in 58.3% on the left side extending predominantly into the nose (58.3%), the sphenoid sinus (41.7%), the orbit (33.3%), and into the maxillary sinus (25%). Tumors of the antrum were seen in 57% on the right side, extending into the ethmoid in 49.9%, the nose in 43%, and into the orbit in 43% leading to major bone destruction of the maxilla in 23.6%. As a rule, cervical adenopathy occured late and suggested a poor prognosis. But still three-year survival in these patients was 20% and five-year survival 12%. No specific primary tumor site or any histology carried a higher risk of cervical lymph adenopathy. Most important, survival was defined by the size of the tumor on diagnosis. There were significant differences between T_1 and T_2 lesions on one side and T_3 and T_4 lesions on the other side ($p < 0.001$). No differences could be detected for T_3 and T_4 lesions. For the outcome of patients the T-staging was more important than tumor histology.

In the group of T_4 lesions different histological diagnosis had some influence on three-year survival but without statistical significance. However, a certain tendency could be observed in the whole series. Prognosis was best for patients with squamous cell carcinomas followed by transitional cell carcinomas, adenoid cystic carcinomas, sarcomas, and adenocarcinomas. In contrast to other examiners (Ohngren, 1933; Weymuller et al., 1980) patients with tumors on the upper level had statistically a significant better prognosis ($p < 0.05$) than patients with tumors of the antrum. Three-year and five-year survival for patients with tumors in the upper level was 55% and 52% compared to 38% and 30% for patients with maxillary sinus tumors.

Statistical analysis of the various treatment modalities versus survival yielded the following results: Outcome of patients with squamous cell carcinomas was best using surgery and postoperative irradiation with a two-year, three-year, and five-year survival rate of 80%, 68% and 52%. In patients with adenocarcinomas, radiation alone or surgery with postoperative irradiation, both yielded a three-year survival of 50% but no five-year survival. Because of the small number of patients in this group no valid conclusion could be made. In patients with transitional cell carcinomas, best results were obtained with the combination of surgery and postoperative irradiation with survival figures for two, three and five years of 58%, 58% and 35%. There were only a few patients with adenoid cystic carcinomas, but best treatment seemed to be surgery alone. Additional radiotherapy worsened the prognosis. Again, therapy of choice for patients with sarcomas was surgery with postoperative radiotherapy leading to two-, three- and five-year survival of 100%, 58% and 42%.

Recurrence rate varied depending on tumor histology. It was highest in adenocarcinomas with 70% next to adenoid cystic carcinomas with 66.6%, transitional cell carcinomas with 64.7%, sarcomas with 62%, and squamous cell carcinomas with 43.8%. Recurrence of tumor effected patient's outcome, nevertheless even in this group, patients with surgery and postoperative irradiation not necessarily died because of tumor. Local recurrence prevailed in squamous cell carcinomas, transitional cell carcinomas, and adenoid cystic carcinomas and could in many instances be controlled by further ablative surgery. In adenocarcinomas recurrence was observed locally, in cervical lymph nodes, in distant metastasis or in a combination of the three locations. In sarcomas, a pattern of local recurrence with simultaneous distant metastasis outside of the neck lymph nodes could be detected. Even with distant metastasis, survival up to two years could be obtained in some patients.

CONCLUSIONS

There are conflicting reports in the literature regarding the timing of radiation therapy in the combined radiotherapeutic and surgical approach to paranasal sinus tumors. The survival rates presented in this series using postoperative

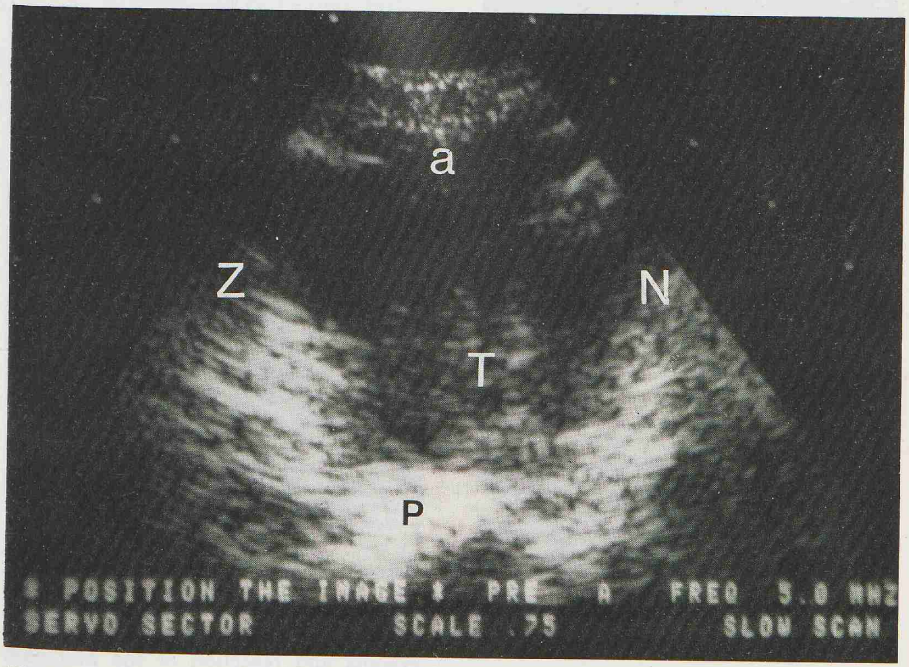

Figure 1. Ultrasound sector scan of a tumor in the posterior maxillary sinus. Z-zygoma, N-nose, T-tumor, a-anterior wall, p-posterior wall

radiotherapy contradict previous statements by Lewis and Castro (1972) or by Cheng and Wang (1977) advocating preoperative radiotherapy.
There is also some discussion about the role of conservatism in dealing with the orbital content (Weymuller et al., 1980). In the series presented in this paper, involvement of the orbital content was found in 43% in maxillary sinus tumors and in 33.3% in ethmoid tumors during surgery making enucleation mandatory. The essential role of surgery in decision making has been stressed many times (Robin and Powell, 1981; Weymuller et al., 1980).
To improve preoperative diagnosis, conventional tomography, computerised tomography, and ultrasound are employed in our institution (Figure 1). The therapeutic concept is a radical surgical with sophisticated high voltage postoperative irradiation. Our survival rates compare with the results presented by Ketcham et al. (1973) and are very high. This aggressive concept has been applied in the past mainly for tumors of the upper level and with some restriction for tumors of the antrum yielding a greater chance for cure in these patients. As new surgical techniques have been evolved in the last few years (i.e. the infratemporal or the extended transmaxillary approach (Figure 2) there is a better chance to control

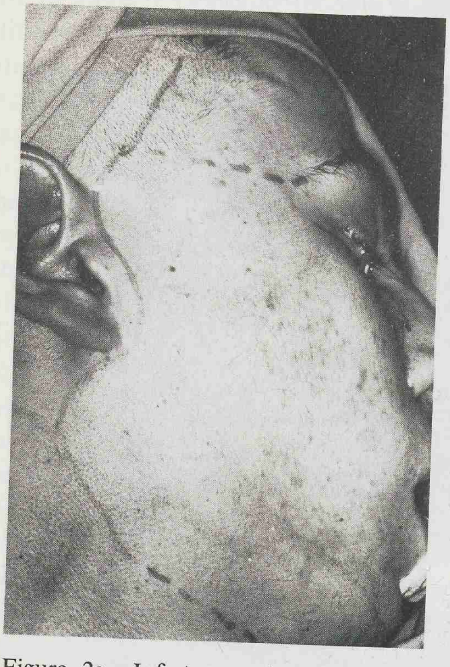

Figure 2a. Infratemporal approach for tumors of the pterygopalatine fossa.

Figure 2b. Extended transmaxillary approach with temporary removal of the zygoma and resection of the pterygoid plate for tumors extending towards the pterygopalatine fossa.

primary and residual tumor of the antrum without major functional impairment. Future surveys will evaluate the possible beneficial effect of improved surgical technique.

ZUSAMMENFASSUNG

In einer retrospektiven Studie wurden 136 Patienten mit Tumoren der Nasennebenhöhlen und der Nase untersucht. Die Überlebensrate der Patienten wurde in Abhängigkeit von der Lokalisation des Tumors, der TNM-Klassifikation, der Histologie, der Art der Therapie und gegenüber verschiedenen anderen Parametern bestimmt. Nach dieser Untersuchung gewährt ein radikaler tumorchirurgischer Eingriff und eine postoperative Hochvolttherapie die größten Überlebensschancen.

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