

Quality of Life following Surgery for Malignancies of the Anterior Skull Base

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ABSTRACT

Radical surgery combined with postoperative radiation is recommended to achieve the best outcomes in patients suffering from malignant anterior skull base tumors. However, information on the impact of such treatment on the quality of life of these patients is sparse. This retrospective study evaluated quality of life in patients with anterior skull base malignancies after transdural resection and radiotherapy. At follow-up, 36% of the patients were alive (mean survival time, 39 months). Only 45% of the patients were able to work in their previous occupation a mean of 15 months after surgery. At follow-up, 58% of the patients had a recurrent tumor. The mean quality of life index was 42 points (range, 0 to 100). The lowest values were on the job item, and the highest mean value was on the family item. All patients, dependents, or both would agree to surgery in the future. Based on these findings, quality of life after transdural surgery for the treatment of anterior skull base malignancies seems to be low.

KEYWORDS: Quality of life, malignancies, anterior skull base, tumor

Sekhar and Moller,¹ among others,²⁻⁵ recommended radical surgery combined with postoperative radiation to maximize outcomes in patients suffering from malignant anterior skull base tumors. Advances in combined transcranial and transfacial approaches has improved survival

for patients with these tumors. Despite modern techniques, surgery for these tumors is always challenging for both surgeon and patient. High recurrence rates (about 70%) and low survival rates (about 50%) 2 years after such surgery question whether surgical intervention can be justified. Data

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on the impact of surgery on quality of life after transdural resection of malignancies of the anterior skull base are sparse. Boyle and associates² and Lang and others⁶⁻⁸ have discussed the need for more studies on this issue. Therefore, this study attempted to provide data on quality of life after skull base surgery.

METHODS

The clinical data and perioperative complications of all patients treated for malignancies of the anterior skull base in our department between 1995 and 2001 were reviewed retrospectively. Surgery was performed in collaboration with the Department of Ear, Nose, and Throat Surgery and the Department of Neurosurgery.

Postoperatively, outcome was assessed by sending patients a modified questionnaire following Blau.⁹ This questionnaire consists of 11 categories (job, leisure, eating, sleeping, friends, money, family, partnership, health, self-assessment, and the overall quality of life). Each item is rated on a scale ranging from 0 to 100, with 0 indicating nonexistent and 100 indicating best possible outcome. According to Blau, values above 70 indicate a fairly successful condition of living. A ranking between 70 and 50 indicates a painful situation but adequate coping. Values below 50 are reported by persons suffering considerably in their present situation.⁹

Finally, a quality of life index (QoLI) was calculated. Favorable outcomes were defined as a score above 49 points on the QoLI. An unfavorable outcome was a score below 50. Patients and relatives were asked whether they would agree to surgery in the future.

Follow-up was performed a mean of 40 months after surgery. In six cases relatives answered the questionnaires because the patients were no longer alive. Six patients were able to answer on their own. The remaining two patients died perioperatively.

RESULTS

Fourteen patients were identified from our data bank. There were 8 men and 6 women (mean age, 58 years; range, 42 to 74 years).

Seven patients (50%) suffered from a squamous epithelial carcinoma, six (43%) had an adenocarcinoma, and one patient (7%) suffered from an esthesioneuroblastoma. In nine cases (64%), the meninges had been infiltrated by tumor. In all patients bony infiltration of the skull base was observed, and 93% of the tumors infiltrated the paranasal sinus (Table 1). In 79% of the patients a frontal transdural resection was performed. Two patients underwent a combined temporal/transfacial and an orbital approach, respectively. Another patient underwent three subsequent operations via a frontal, transfacial, and endonasal approach. In 79% of the patients, gross total resection was achieved. All patients underwent postoperative radiation (30 to 64 Gray). One patient also received additional chemotherapy.

Anterior cranial fossa cerebrospinal fluid rhinorrhea was treated by lumbar drainage in 21% of the patients without further consequences. Two patients (14%) died perioperatively; both suffered from early postoperative intracranial bleeding.

At follow-up, 36% of the patients were still alive (mean survival time, 39 months). Survival time was influenced by tumor type. Patients with a squamous epithelial carcinoma survived a mean of 35.5 months. Patients suffering from adenocarcinoma survived only 23.2 months. The survival of patients with tumor infiltrating the meninges was shorter than the survival time of patients with no evidence of such infiltration (mean, 39.8 months versus 49.5 months). The 3-year survival rate for patients with meningeal infiltration was 60% compared with 100% in patients without infiltration. A mean of 15 months after surgery, 58% of the patients showed a tumor recurrence.

At follow-up only 42% of the patients were free of symptoms. Most patients suffered from headache (25%), and 17% complained of nasal secretions. Two patients developed postoperative seizures. Five patients complained of visual deficits,

Table 1 Frequency of Tumor Location and Infiltrated Structures

Patient	Location and Infiltration															
	Paranasal Sinus	Ethmoidal Labyrinth	Frontal Sinus	Dura Mater	Nasal Cavity	Frontobasal Bone	Sphenoid	Orbitonasal Bone	Maxillary Sinus	Lateral Wall and Floor of Orbita	Frontal Lobe	Temporobasal Bone	Temporal Lobe	Nervus Maxillaris	Rectus Muscle	
1	x	x			x	x										
2	x	x	x		x		x	x	x							
3	x	x	x	x		x		x		x						
4	x	x	x	x	x	x		x		x						
5	x	x	x	x	x	x		x	x	x						
6			x	x		x		x		x						
7	x		x	x	x				x							
8	x	x	x		x	x			x							
9	x	x		x		x			x							
10	x		x			x		x		x			x			
11	x		x		x			x	x	x						x
12	x			x	x			x		x		x	x			
13	x	x	x	x	x											
14	x	x	x	x	x			x	x	x						
%	92.9	71.4	71.4	64.3	64.3	57.1	57.1	57.1	50	35.7	14.2	7.1	7.1	7.1		7.1

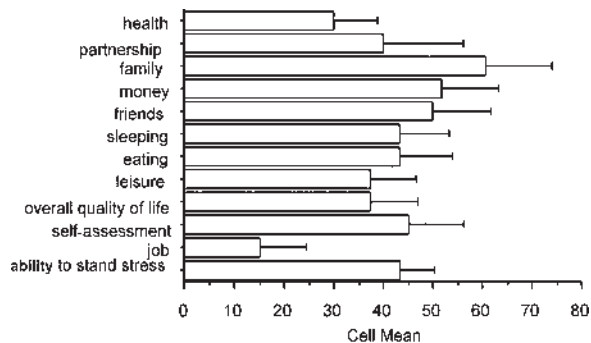


Figure 1 Results of the questionnaire regarding quality of life.

three of whom underwent unilateral enucleation. Seventy-three percent of the patients experienced postoperative anosmia, and 18% were aphasic and hemiparetic. All patients and dependents stated that they would agree to surgery in the future.

In our study population, only 45% of the individuals were able to return to their previous job. The mean QoLI was 42 points, the lowest values were found on the job item (15 points, mean), and the highest mean value was found in the family item with 61 points. See also Figure 1 and Table 2.

DISCUSSION

In this series only 36% of our patients were still alive by follow-up. This rate is at the lower

limit of the reported survival rates in the literature (44 to 74%).^{2,10} It is well known that histopathological diagnosis and grade are significant prognostic factors. Consistent with the literature, we found that patients suffering from adenocarcinomas had a shorter survival time than patients treated for squamous epithelial carcinomas.⁴

As a predictor of survival, meningeal infiltration is controversial. Kraus et al¹¹ reported a survival rate of only 14% in patients with dural infiltration compared with 83% in patients without evidence of such infiltration. Clayman and coworkers¹² reported no long-time survivor in their group of patients with dural infiltration. In our study the 3-year survival rate in patients with dural infiltration was 60% and 100% in patients without such infiltration. Long-time survival rate seems to be significantly influenced by dural infiltration, but it seems better than previously reported.

The recurrence rate of 58% in our study seems to be high, but it is within the range reported in the literature. Despite radical surgery, Pitman and colleagues³ and Naficy and associates¹³ achieved recurrence rates of 71 and 76%, respectively.

Most studies in the literature dealing with malignant tumors of the anterior skull base discuss the survival rates, perioperative complications,

Table 2 Quality of Life for Different Items According to Different Patient Subgroups

Quality of Life	All Patients Mean	Still Alive after Hospital Stay Mean				
			P Mean	R Mean	Min P/R	Max P/R
Job	15	21.4	18	15	0/0	80/60
Self-assessment	45	60	82	32.5	50/10	100/60
Leisure	37.5	50	64	46	10/30	70/100
Eating	43.3	57.8	72	40	40/0	100/80
Sleeping	43.3	57.8	60	55	10/40	100/80
Friendship	50	66.7	72	60	10/20	100/90
Money	51.7	68.9	70	67.5	40/20	100/100
Family	60.8	81.1	90	70	50/10	100/100
Partnership	40	57.1	60	25	0/0	100/100
Health	30	40	48	30	10/0	100/50

P, estimation by patients; R, estimation by relatives; Min, minimum; Max, maximum.

recurrence rates, and surgical procedures employed for treatment of these lesions.² The literature describing overall outcome, especially quality of life after these procedures, is sparse. Lang et al⁶ reported 14 patients suffering from a mixture of deep-seated lesions in the central skull base region using parts of the SF 36 to measure quality of life. They found that only 50% of the patients were scored as having normal values postoperatively, indicating an adequate quality of life.

Considering the QoLI of all patients according to Blau,⁹ we found that only 50% of the patients scored above 50. Among the survivors 66.7% of the patients were above this limit. The worst mean values were found on the items on job (21.4), health (40), and leisure (50). The best quality of life was reached on the items family (81.1), money (68.9), and friendship (66.7).

Lang and colleagues⁶ also found a decline in quality of life regarding energy and vitality of their patients. Comparing quality of life in patients who underwent decompressive craniectomy after supratentorial ischemia and in patients who suffered from severe head injury, patients who underwent surgery for malignancies of the anterior skull base (42 points, mean, QoLI) scored in the same range as patients suffering from severe head injury (36.3 points, mean, QoLI).¹⁴ Patients treated for severe ischemia were reported to have a better quality of life (60 points, mean, QoLI).¹⁵

CONCLUSION

Quality of life after surgery of skull base tumors seems to be quite low. The perioperative morbidity and mortality of rates associated with surgery of these tumors is relatively high. Furthermore, the mean survival time of about 39 months in this study is relatively low. Thus, it appears that these kinds of tumors remain a challenge despite contemporary surgical techniques.

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