Results and Discussion

Introduction

Carcinoma of the middle ear is a rare clinical entity representing less than 0.2% of all head and neck carcinomas.1 Evaluation of uncommon disorders is often limited by small numbers of patients at a given institution. Population-based databases are ideally suited to study rare disorders because of the relatively large numbers of study patients. The objective of this study was to utilize the National Cancer Institute’s (NCI) Surveillance, Epidemiology, and End Results (SEER) database to determine the incidence, treatment patterns, and survival rates of middle ear carcinoma.

Methods

Cases of middle ear cancer (anatomic site code C30.1) diagnosed between 1973-2004 were extracted from the SEER database using SEER*Stat software version 5.3.6. Data were queried based on the “middle ear” anatomic code (C30.1). Patient and disease characteristics such as age at diagnosis, gender, tumor histological type, extent of disease, treatment type, and survival statistics were also extracted. SEER’s classification for extent of disease of middle ear cancers were grouped to represent local, regional, or metastatic disease categories. The database does not use currently-accepted staging systems for temporal bone carcinoma.1,2 Five-year survival was analyzed with SPSS software version 15 (Chicago, IL), with significant differences determined by the Wilcoxon statistic. Data were extracted and are reported in accordance with the SEER database user agreement.

Results

The demographics of the patients included in the study are shown in Table 1. After excluding lymphomas, rhabdomyosarcomas, and death-certificate-only diagnoses, 215 eligible cases of middle ear carcinoma were identified. The 5-year observed survival rate for the 215 patients this study was 38.4%. The median duration of follow-up was 48.4 months.

Observed survival by treatment for patients with cancer of the middle ear who were diagnosed from 1988-2003. (N=123) (p<0.001).

Survival rates by histologic types—grouped as squamous cell carcinoma (62.8%), adenocarcinoma (18.2%), other carcinomas (13.0%), and non-carcinomas (6.0%)—were 23.9%, 65%, 60%, 60.0%, and 38.6%, respectively (p<0.003). Squamous cell carcinoma survival rate was significantly lower than adenocarcinoma (p<0.001), but no other comparisons were significant.

Of the 123 patients with known stage, 23.6% had local, 69.1% had regional, and 7.3% had distant disease, with five-year survival rates of 64.9%, 34.2%, and 0%, respectively (p<0.001) (Figure 2). All groups were significantly different: local vs. regional (p<0.001), local vs. distant (p<0.001), and regional vs. distant (p<0.012). Treatment modalities included surgery (51.2%), radiation (16.3%), surgery and radiation (38.8%), or no treatment (8.4%) with 5-year survival of 69.2%, 14.6%, 28.4%, and 0%, respectively (p<0.001) (Figure 3). Surgery’s survival rate was significantly higher than the other three treatment groups’ (all being p<0.001), and surgery plus radiation (RT) had significantly higher survival than no surgery or RT (p<0.018). The difference between RT and no surgery or RT approached, but did not attain, significance (p=0.083), and the difference between RT and surgery plus RT was not significant (p=0.486).

Table 1. Patient, disease, and treatment characteristics for patients with cancer of the middle ear (N=215). *Mean age is 60.7

Discussion

National databases or data sets that pool multi-institutional cases are helpful for examining rare clinical entities. The present study is the first to use the NCI’s SEER database to evaluate carcinoma of the middle ear and temporal bone. The observed survival for patients in this study was similar to population-based data from other countries.3 The present study showed that squamous cell carcinomas are the most common type of middle ear carcinoma with the worst 5-year observed survival. Adenocarcinomas and “other carcinomas” had significantly better 5-year survival rates. Similar to other head and neck cancers, the majority of the patients in this study presented with advanced local disease, which also portends a worse survival.4 Patients with distant disease had very poor survival, with only an 11.1% two-year survival rate and no patients surviving to three years.

For the past 30 years, surgery alone or surgery with adjuvant radiotherapy have remained the most common treatment modalities for treatment of middle ear carcinoma in the United States. Patients who received surgery alone for their treatment had a statistically significant survival advantage over patients who received multi-modality therapy or radiotherapy alone. This result is most likely due to patients with less advanced disease being treated with surgery alone that did not require additional therapy. However, extent of disease data were not available for all patients, so this conclusion cannot be based on the data.

Conclusion

Patients with middle ear carcinoma have a relatively poor prognosis, reflected by a 5-year survival rate of 38.6%. However, subsets such as those with adenocarcinomas (65.0%) and with localized tumors (64.9%), demonstrated significantly better survival. Patients with middle ear carcinoma typically present with locally advanced disease, which has a poorer prognosis than early disease. Surgery alone or a combination of surgery and radiation therapy are the most frequently used treatment modalities. Surgery alone had significantly better survival than the other treatment groups, presumably due to less advanced disease. These population-based data are useful in understanding the natural history of middle ear carcinoma and counseling patients.

References


Figure 2. Observed survival by extent of disease for patients with cancer of the middle ear who were diagnosed from 1988-2003. (N=123) (p<0.001)

Figure 3. Observed survival by treatment for patients with cancer of the middle ear (N=203) (p<0.001). Radiation therapy (RT), Surgery and Radiation (SRT)

Figure 1. Observed survival by histologic type for patients with cancer of the middle ear (N=215) (p=0.003). Squamous Cell Carcinoma (SCC)