

Nineteen patients from [Brescia](#) received [endoscopic resection](#) with [transnasal craniectomy](#) and [subpial](#) dissection (ERTC-SD) and 11 had pathological-proven brain invasion. Histologies were 6 [olfactory neuroblastomas](#) (ONB), 3 [neuroendocrine carcinomas](#), and 2 [intestinal-type adenocarcinomas](#). Mean follow-up was 21.9 months. Three-year overall, local recurrence-free, and distance recurrence-free survivals were 65.5%, 81.8%, and 68.2%, respectively. Overall and distant recurrence-free survivals were significantly better in patients with ONB ($P = 0.032$ and $P = 0.013$, respectively). [Hospitalization](#) ratio was 4.1%. [Complication](#) rate was 10.5%.

In selected nasal-ethmoidal tumors with brain invasion, ERTC-SD can provide good local control, satisfactory [survival](#), and limited [morbidity](#) ¹⁾.

Klironomos et al., presented the use of pure EEA in the management of ENB in the [Toronto Western Hospital](#), along with a literature review. They retrospectively reviewed the clinical, radiology and pathology records of patients with ENB treated during the period July 2006 to January 2016. During the above period, ten patients with ENB were treated using pure EEA. The mean age was 47.5 years. The gender distribution was: eight males, two females. The most common presenting symptoms were nasal obstruction and discharge or epistaxis (8/10). The mean duration of symptoms was 1.5 years. All patients had preoperative confirmation of ENB by biopsy. Five patients received neoadjuvant radiation and four underwent postoperative radiation. One patient did not receive any radiotherapy and no patient received chemotherapy. Gross total resection was achieved in all patients and intraoperative microscopically negative surgical margins achieved in 9/10 (90%). No major intraoperative complications occurred. The most common postoperative complication was nasal infection. Cerebrospinal fluid fistula was noted in one patient. During the follow-up period of 6-120 months (mean 74.8) two cases of neck lymph node recurrence were observed. No deaths due to the disease occurred during the follow-up period. Pure EEA offer excellent results in the management of ENB. Neoadjuvant radiation treatment is promising although more studies need to establish its role ²⁾.

There is a scarcity of data about different treatment strategies. Intensity modulated radiotherapy (IMRT) and carbon ion radiotherapy (CIRT) are advanced radiation techniques that might improve local tumor control.

In a retrospective analysis of 17 patients with ENB (Kadish stage $\geq C$: 88%; $n = 15$). Four patients had already undergone previous radiotherapy (RT). The treatment consisted of either IMRT ($n = 5$), CIRT ($n = 4$) or a combination of both techniques ($n = 8$). Median follow-up was 29 months. (3) Results: In patients that had not been irradiated before ($n = 13$), calculated overall survival (OS) and progression free survival (PFS) rates after 48 months were 100% and 81% respectively (Kaplan-Meier estimates). Two of four patients that underwent reirradiation died after RT, presumably due to tumor progression. Besides common toxicities, five patients (30%) showed mostly asymptomatic radiation-induced brain changes, most likely due to a disturbance of the blood-brain barrier.

The results demonstrate that IMRT, CIRT, a combined approach of IMRT and CIRT as well as reirradiation with CIRT seem to be feasible and effective treatment methods in ENB. ³⁾.

ENB is safely and effectively treated with craniofacial resection (CFR) followed by proton beam irradiation. The high incidence of regional metastases warrants strong consideration for elective neck

irradiation. Proton beam radiation is associated with lower rates of severe late-radiation toxicity than conventional radiotherapy ⁴⁾.

The National Cancer Database (NCDB) was used to identify patients diagnosed with ENB between 2004 to 2015. Patients were excluded based on the ability to properly stage their disease as well as the availability of treatment data.

Eight-hundred eighty-three patients had sufficient data for analysis. On multivariate analysis, age and government insurance were associated with primary surgical treatment, whereas tumor stage, gender, race, hospital type and volume, and comorbidity score were not. Age, charlson-deyo comorbidity (CDCC) score, hospital volume, and nodal status were found to be predictors of survival. Multivariate-analysis controlling for stage failed to demonstrate clear survival differences between staging in both TNM and Kadish systems. T-stage and the presence of regional nodal metastases were associated with an increased risk of positive margins on multivariate analysis.

Although primary surgical management and positive margins can be predicted by certain patient and tumor factors, clinical staging systems for ENB poorly predict prognosis over a 10-year horizon ⁵⁾.

1)

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