

## We Evaluated the Impact of Treatment Modality on the Outcome of Olfactory Neuroblastoma

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**Purpose** : We evaluated the impact of treatment modality on the outcome of olfactory neuroblastoma.

**Materials and Methods** : We analyzed retrospectively 40 previously untreated and histologically confirmed olfactory neuroblastoma patients treated between 1989 and 2005. There were 21 male and 19 female patients. According to the Kadish's classification, 3 patients (8%) were stage A, 5 (12%) stage B, and 32 (80%) stage C. Treatment included surgical resection, radiotherapy, chemotherapy, or a combination of these methods. The median follow-up for surviving patients was 61 months (range, 23–178 months).

**Results** : The 5-year overall survival (OS), disease-free survival (DFS), local progression-free survival (LPFS), and distant metastasis-free survival (DMFS) rates were 54%, 38%, 55%, and 55%, respectively. The 5-year OS was 100% for

Kadish A, B and 41% for Kadish C ( $p=0.0124$ ). Subgroup analysis was done for the Kadish C patients. The 5-year OS rate for the patients who were received all three therapy was 100% as compared with 17% for the surgery and radiotherapy group ( $p=0.0226$ ). Intraorbital extension ( $p=0.047$ ) and treatment era (1989–2000) ( $p=0.005$ ) were found to be important for impaired OS. Cross-tabulations revealed a good balance between the two era groups concerning age, sex, skull base penetration, radiotherapy, surgery, and resection status. However the patients who were received chemotherapy were more in 2001–2005 era group than 1989–2000 era group ( $p=0.001$ ).

**Conclusion** : To achieve better outcomes for Kadish C olfactory neuroblastoma, combined chemoradiotherapy is recommended in addition to surgery.