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RESEARCH ARTICLE

COBLATION A NEW TOOL IN MANAGEMENT OF NASOPHARYNGEAL RHABDOMYOSARCOMA

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ABSTRACT

Rhabdomyosarcoma is a highly malignant neoplasm that arises from embryonic mesenchyme (Horn, 1958). It is the most common soft tissue tumor in children, with the head and neck region accounting for 35-40% of cases (Healy, 2012). Rhabdomyosarcoma in the nasal cavity often begins as a polypoid growth and may easily be mistaken for nasal polyps. For this reason, it is important that polypoid growths in the nasal cavity occurring in childhood to be biopsied. Embryonal rhabdomyosarcoma of the nasopharynx is an uncommon tumor occurring almost exclusively in children. We present a case of nasopharyngeal rhabdomyosarcoma in 3 years old male child which was excised by coblation technique. The modality of treatment is surgical debulking followed by radiotherapy with or without chemotherapy. We are the first one to use coblation as a new tool for surgical excision of nasopharyngeal rhabdomyosarcoma in a 3 years old child.

INTRODUCTION

The first mention of rhabdomyosarcoma was made by Weber in Virchow's Archives (1855). This malignant tumor arising from skeletal muscle was established as separate clinical entity by the work of Stour (I 946). Horn and Enterline (1958) first classified the rhabdomyosarcoma into four subtypes - a) Alveolar b) Pleomorphic, c) Embryonic, d) Botryoids. They also observed that embryonal variety was a tumor of children and infant. Rhabdomyosarcoma of nasopharynx presents as polypoidal growth which can be easily mistaken as nasal polyps. The incidence of rhabdomyosarcoma is 4.5 cases/million children/adolescents per year and in more than 50% of cases, rhabdomyosarcoma occurs during the first decade of life (Ries, 1999). Several environmental exposures have been associated with increased rhabdomyosarcoma risk, including paternal cigarette smoking, (Grufferman, 1982) advanced maternal age and x-ray exposure in utero (Grufferman, 1991) maternal (Grufferman, 1982) and child's (Hartley, 1988) antibiotic use and maternal recreational drug use (Grufferman, 1993). The largest case-control study of childhood rhabdomyosarcoma thus far was conducted in the US in the mid-1980s and included 249 rhabdomyosarcoma cases (Yang, 1995). The majority of associations between environmental exposures and risk for rhabdomyosarcoma found in the literature, results from this study (Grufferman, 1982; Grufferman, 1991; Grufferman, 1993).

Case Report: A 3-year-old male child presented in our outpatient department with complains of bilateral nasal obstruction, mucopurulent nasal discharge, breathing difficulty, mouth breathing and snoring which were gradually progressive since 6 months.

The child was fairly built and averagely nourished with no dysmorphic features. Nasal surgery was done on this child twice for the same complaints and both the times the diagnosis was considered as nasal polyp. On examination there was a lobulated mass seen on anterior rhinoscopy. On probing there was no bleeding through this mass. On examination of the oral cavity and oropharynx there was bulge seen on the soft palate. Posterior rhinoscopy showed a mass present in to the nasopharynx which was pearly gray in colour, lobular, fleshy and arising from the right choana and extending up to the uvula. Patient was posted for CT scan of nose, paranasal sinus and oral cavity. CT scan was suggestive of lobulated soft tissue mass in the nasapharynx which was arising from soft palate and encroaching in to the oropharynx abutting the posterior pharyngeal wall. The provisional differential diagnosis was pleomorphic adenoma or minor salivary gland, myoepithelioma of soft palate. CT scan also revealed bilateral maxillary, ethmoidal and right sphenoid sinusitis. Therefore, diagnostic nasal endoscopy (Figure 1) was done under general anaesthesia to confirm the finding of CT scan. Biopsy was also taken from nasal mass to confirm the diagnosis. Histopathological examination of biopsy report was suggestive of rhabdomyosarcoma. After confirming the diagnosis, child was posted for surgical excision of tumor. Zero degree nasal endoscopy along with coblation wand for adenoidectomy was used for complete surgical excision of nasopharyngeal rhabdomyosarcoma under vision (Figure 2). Tissue was sent for histopathological reporting. Surgery was uneventful and without any complication or recurrence of tumour.

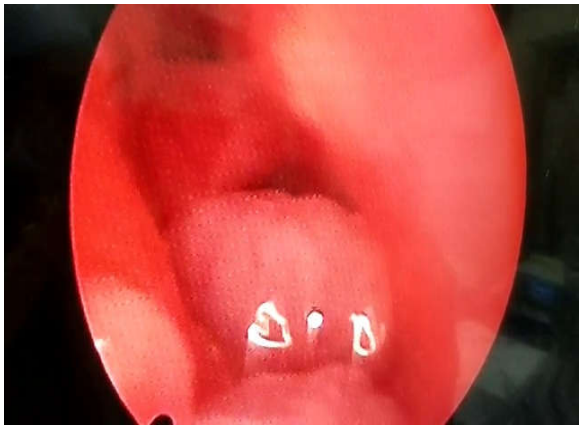

Figure 1. Showing Nasal endoscopic view of rabdomyosarcoma

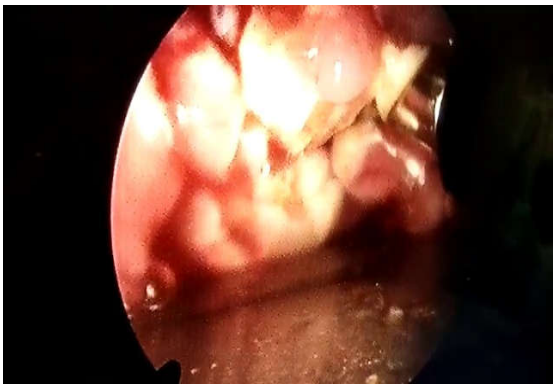

Figure 2. Showing nasopharyngealendoscopic view and rabdomyosarcoma being removed by coblator wand from posterior surface of soft palate

After 4 weeks postoperatively Radiotherapy was given to the child. Patient was followed up for 6 months at the interval of 1 month, 3 months and 6 months.

DISCUSSION

There are four variants of rhabdomyosarcoma such as embryonal, alveolar, pleomorphic and botryoid varieties (Donaldson, 1973). Botryoid rhabdomyosarcoma is a subtype of embryonal rhabdomyosarcoma, that originates in mucosa lined structures such as the nasopharynx, common bile duct, urinary bladder, and vagina in younger age groups. Embryonal rhabdomyosarcoma has the second highest frequency in the head and neck region, orbit being the most common in children (Maurer, 1977). Embryonal rhabdomyosarcoma develops as a result of oncogenic mutations involving the anaplastic lymphoma kinase, RAS, fibroblast growth factor receptor 4, phosphatidylinositol-4, 5-bisphosphate 3-kinase catalytic subunit alpha or catenin-cadherin-associated protein beta 1 genes (Ray, 2012). The tissue of origin of embryonal rhabdomyosarcoma is derived from totipotent mesenchymal cells or from muscles and in the present case may be palatal muscles around the Eustachian tube. Although the characteristic feature is embryonal myoblasts, the diagnosis of rhabdomyosarcoma depends on showing the myxoid area in different mesenchymal blastoma of elongated cells just under the squamous epithelium. Rhabdomyosarcoma of the nasopharynx presents as a polypoid growth which can be easily mistaken for nasal polyps. The histopathological diagnosis of rhabdomyosarcoma relies on demonstrating myxoid areas in different mesenchymal blastoma of elongated cells just under the squamous epithelium (Fu, 1976). Where surgical resection of the tumor is not possible debulking followed by radiotherapy alone or along with chemotherapy should be the ideal treatment (Pandhi, 1980). Preoperative assessment of the tumour size, bone erosions, and intracranial invasion using imaging modalities such as computed tomography and magnetic resonance imaging is very important to assess resectability of the tumour. Both rhabdomyosarcoma prognosis and treatment depend on the histopathological subtype (Stevens, 2005). Of all patients with Head and Neck rhabdomyosarcoma, more than half have embryonal rhabdomyosarcoma, which is a favourable prognostic factor, whereas the alveolar subtype carries a poorer prognosis (Wachtel, 2004).Other rhabdomyosarcoma's negative prognostic factors include parameningeal localization, presence of distant metastases, non-radical primary surgical procedure, tumour size more than 5 cm, age at diagnosis more than 10 years old and time to tumour relapse (Dasgupta, 2011). The tumour was removed in toto with coblation technique. There was minimum intraoperative blood loss as the coblator has the advantage of cutting as well as coagulation cautery. Nasopharyngeal area is difficult to access so endoscope was passed from nasal cavity and coblation wand from oral cavity which was not obstructing each other's view. Coblation pronounced as controlled ablation technology was recently used in surgery as it is minimally invasive and low thermal technique. Coblation uses bipolar waves to create a plasma field, which disassociates molecular bonds within soft tissues, providing haemostasis with minimal thermal damage and allowing for early wound healing (Carney, 2008). When current from radiofrequency probe pass through saline medium it breaks saline into sodium and chloride ions. These highly energized ions form a plasma field which is sufficiently strong to break organic molecular bonds within soft tissue causing its dissolution (Lee, 2004). As it uses plasma field not thermal energy to break the tissue, there is minimal thermal damage to surrounding tissue and minimal postoperative pain. However, there are limitations to the use of radiofrequency coblation in oncological procedures. Accurate histopathological assessment of tumor margins may be difficult as coblation leaves a 2-3 mm ablative margin around the tumour (Carney, 2008; Roy, 2009).

Conclusion

- Nasopharyngeal rhabdomyosarcoma is a rare tumour which is most often mistaken as a nasal polyp.
- Hence the diagnosis of nasopharyngeal rhabdomyosarcoma is difficult. Biopsy is a better option to confirm the diagnosis prior to definitive treatment.
- Nasopharyngeal area is difficult to access. Coblation is a new tool which can be used safely for excision of rhabdomyosarcomas of nasopharynx. It's definitively having an advantage of minimal blood loss, less thermal damage. However determining microscopic margin is difficult in case of coblation. Once diagnosis is confirmed it's a safer tool to use with minimal side effects.

Conflict of interest: There is no conflict of interest

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