

Postoperative Complications in Children with Congenital Neck Masses: A Review Article

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Abstract

Congenital neck lesions (CNL) are commonly seen in children. Due to different presentations and complications after surgical treatment, a thorough knowledge of regional anatomy is paramount in the management of these children. In this study it is aimed to review the frequently encountered surgical complications during and following surgical treatment of children with special reference to thyroglossal duct remnants, branchial cleft anomalies and dermoid cysts.

Key Words: thyroglossal duct remnants; branchial cleft anomalies; dermoid cysts; complication

Introduction

Congenital neck lesions (CNL) are common clinical concern in infants and children. The differential diagnosis includes congenital, inflammatory and neoplastic lesions. The physicians caring for children with CNLs should be aware of different presentations since these lesions are known to be complicated by infection. An orderly examination of the neck with a clear understanding of embryology and anatomy of the region will facilitate the diagnosis. The awareness of regional anatomy is important in avoiding injury to crucial structures during surgical intervention. In this study it is aimed to review the frequently encountered surgical conditions following surgery of children with CNL.

There are many reasons for CNL encountered in pediatric daily practice and most of these lesions include thyroglossal duct remnants (TGDR), branchial cleft anomalies (BCA) and dermoid cysts (DC) (1). TGDRs are the most common form of CNLs, accounting for up to 70-90% of such lesions (2-4). Main presentations of TGDR are that of a midline neck mass or infection as a single or a recurrent event. In a recent report, more than half of the patients (53.4%) with CNLs presented with TGDR (5). A 7% incidence of TGDR in a postmortem study of 200 adults has been reported (6). These lesions are commonly observed in children or adolescents and in a meta-analysis its incidence was found to be higher in children than in adults (7). Although there are conflicting reports with regard to sex distribution (8-10), equal distribution among males and females has been reported in most of the reviews (7,11,12). It should be kept in mind that a true female dominance does exist amongst familial TGDRs (13). Diagnostic methods in the preoperative evaluation of TGDR include US, CT, MRI, radioisotope thyroid scanning, and thyroid function test (14). US is the most common test ordered in children and it is noninvasive and offers valuable information of both the TGDR and thyroid gland (15, 16). The absence of a normal appearing thyroid gland in the lower neck should alert the clinician that ectopic thyroid tissue might be present within the TGDR or elsewhere along the course of the thyroglossal duct and thyroid scintigraphy with thyroid function tests should be performed (17). Thoracic CT or MRI may be performed for the documentation of other comorbidities. Concerning fine needle aspiration, although the diagnostic

sensitivity of 62% and a positive predictive value of 69% is reported, it is not popular for diagnosing TGDR in children (14,18). The most common location for the cystic mass in TGDR is close proximity to the hyoid bone with an incidence of 66%, but other locations including lingual, suprathyroid, suprasternal or within the thyroid gland have also been reported (7,19).

The incidence of complications following the Sistrunk's procedure has been noted up to 29% (20). Recurrence is the most commonly seen complication following the surgical procedure for TGDR and it is reported to be 2.6% to 5% in most recent literature (21,22). Deeper and wider excisions including removal of midportion of hyoid bone are suggested to remove any missed epithelial remnants during the subsequent operations in these patients. Apart from recurrence, abscess or hematoma requiring surgical drainage, inadvertent entry into the airway, tracheotomy, hypoglossal nerve paralysis, hypothyroidism have also been reported (23, 24). Intraoperative identification of the thyroid cartilage and thyrohyoid membrane is helpful landmark in identifying hyoid bone. Malignancy is often an underestimated complication which is reported fewer than 1% of patients with TGDR (25). Minor complications may include seroma, local wound infection and dehiscence (20). Although the Sistrunk's procedure is safe and successful technique with low complication rates, rare and life threatening complications should be kept in mind during the management of these children.

BCAs comprise 20%-30% of all head and neck lesions with an equal sex distribution (21,26-29). The most common type is the second cleft anomalies accounting for 95% of all lesions (1,5). They present as cysts, sinuses, or fistulae and clinical presentation heavily depends on the type of the lesion and branchial fistulae and sinuses are diseases of childhood while cysts are more common in adults (30). However in the largest review of BCAs comprising 232 procedures, 90% of which included second branchial anomalies with an incidence of 13.5%, only 28 children with second branchial anomalies demonstrated complete fistulae (31). An upper airway endoscopy may be useful in determining the presence of a pharyngeal opening (21). On the contrary to adults, fine needle aspiration biopsy or incisional biopsy should not be performed in children (26). US

and CT may be helpful in defining the lesion, its anatomic course and for complete visualization of the tract (26). The definitive treatment of these lesions is complete surgical excision of the entire tract (1,32). There is controversy on the timing of the resection. Some suggest early resection in order to prevent infection whereas others advocate waiting until the ages of 2-3 years (26, 33, 34).

Recurrence is the most common complication following surgery for BCA and it has been reported as high as 22% (35). So during treatment of these lesions meticulous surgical technique should be performed. Injury to nearby structures including internal jugular vein, carotid vessels, hypoglossal, glossopharyngeal nerves, mandibular branch of the fascial nerve should be kept in mind (36). In the case of bilateal fistula, an underlying genetic disorder including branchio-oto-renal syndrome should be considered (37). Other complications of BCA include lateral neck mass and suppurative thyroiditis which should raise the suspicion of a third BCA. Fascial plane disruption and scarring are other complications especially seen after surgery for third BCA and postoperative wound infection and transient hoarseness have also been reported following surgery for third BCA with the rates of 11% and 5.6%, respectively (38)

Dermoid cyst is another lesion in the differential diagnosis of CNL. It is a germ cell tumor that results from the inclusion of embryonic epithelial elements, and contains ectodermal and endodermal components (21,37). Nomenclature of these lesions is quite confusing and not uniform which are divided into epidermoid, dermoid and teratoid cysts based on the histological findings, the term DC has been used for all three lesions (39). Cervical lesions typically present 20% of head and neck dermoids and are usually diagnosed before the age of 3 years (21). Simple excision is all that is needed for cure but midline dermoids may travel through deeper tissues and may require a more extensive surgery (40). Recurrence is not usual occurrence but every effort should be made to remove the entire cyts without rupture of the cyst wall and spillage of contents (41). Intracranial extension is another rare complication which requires extensive surgery (40). Periosteal attachment may necessitate removal of bone fragement together with DC and should be kept in mind if the mass is not mobile on palpation.

Conclusion

In conclusion, complications following surgery for CNMs may be observed during the management of these children. Meticulous surgical resection is optimal choice of therapy not only for aesthetic reasons but for the avoidance of complications including recurrence. Early referral of these patients for pediatric surgeons and accurate and timely surgical treatment is suggested.

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