Pediatr Radiol (1998) 28: 709–710

Jeremy S. Green
Fiona L. Dickinson
Andrew Rickett
Andrew Moir

MRI in the assessment of a newborn with cervical teratoma

Received: 4 August 1997
Accepted: 12 February 1998

J. S. Green · F. L. Dickinson (✉)
A. Rickett
Department of Radiology,
Leicester Royal Infirmary,
Leicester LE1 5WW, UK

A. Moir
Department of ENT Surgery,
Leicester Royal Infirmary, Leicester, UK

Abstract Teratoma of the head and neck is a rare lesion comprising 6 % of all teratomas, with only 3 % occurring in the cervical region [1]. Most are non-malignant lesions consisting of a variety of tissues of variable maturity, commonly with neuroepithelial and thyroid elements. They often present as a large cystic mass in the neck of a neonate or infant and frequently cause respiratory embarrassment due to local mass effect necessitating urgent surgical intervention. They may be difficult to distinguish from cystic hygromas, both clinically and radiologically. Imaging plays an important role in the assessment of these lesions, especially in preparation for surgery. We present a case of cervical teratoma and emphasise the role of MRI.

Case report

A girl weighing 3.6 kg was born at term by emergency caesarean section for foetal distress and failure to progress after an otherwise uneventful pregnancy. A large brilliantly transilluminable mass in the right side of the neck caused difficulties with intubation. She was ventilated and transferred to the regional neonatal intensive therapy unit. The chest radiograph showed calcification within the mass (Fig. 1) and US at the referring hospital demonstrated multiple thin-walled cysts. MRI was performed prior to surgical resection (Fig. 2).

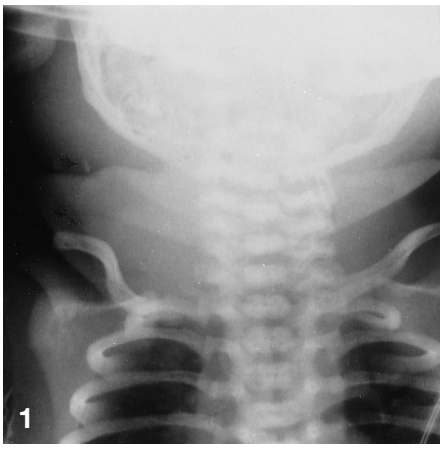
At operation, the mass was entirely resected along with the right lobe of the thyroid gland to which it was closely related. Histopathology revealed a 40-g lobulated mass containing multiple cysts with intervening papillary structures resembling choroid plexus, foci of cartilage, bone, muscle, brain, embryonic neuroepithelium and glandular tissue. The appearances were consistent with a teratoma. There was no evidence of malignancy. Extubation was possible within a few days of surgery. Serum α-fetoprotein (AFP) levels, which were raised at 24 000 IU, fell rapidly following surgery. β-human chorionogonadotrophin (β-HCG) levels were not elevated.

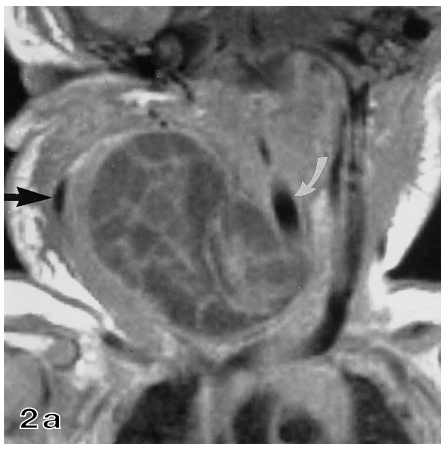
Discussion

Histological immaturity in cervical teratomas does not equate with malignancy and usually correlates with immaturity of the host. Metastatic spread to regional nodes has been described in congenital teratoma but is extremely rare in comparison with those presenting in adulthood, which have an increased incidence of malignancy [2]. Serum AFP and β-HCG levels may be elevated and used as a guide to tumour recurrence.

Many potential complications may arise during pregnancy or in the intrapartum period because of tumour size. Polyhydramnios due to impaired swallowing occurs in as many as 19 % of cases and is more likely with larger lesions [2–4]. Stillbirth and premature or obstructed labour are also common [4].

Even with surgery, mortality is primarily related to the degree of respiratory compromise [1], a feature seen in the majority of cases. Untreated, there is 80–100 % mortality compared with approximately 10 % following surgery [4, 5]. Recognition on prenatal sonography is therefore important so that steps may be taken to protect the airway at birth. Although intubation may be difficult, tracheostomy is seldom required [4].





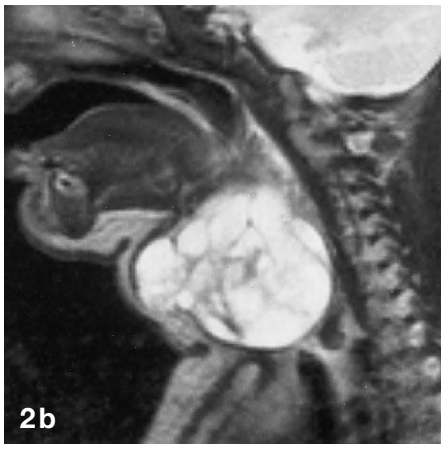


Fig. 1 Chest radiograph showing a large soft-tissue mass containing small flecks of calcification in the right side of the neck (*black arrow*)

Fig. 2 a, b MRI demonstrating a multilocular cystic mass in the anterior triangle of the right side of the neck. **a** Coronal T1-W image shows the external jugular vein (*black arrow*) stretched over the lateral aspect of the mass and the trachea (*white arrow*) displaced medially. **b** Sagittal T2-W image shows the inferior aspect of the mass lying just above the sternum and the brachiocephalic vein. Superiorly, the mass abuts, but does not involve, the base of the tongue

Surgical resection is usually performed early due to the threat of airway compression. The bulk of the lesion is usually unilateral with extension to the midline. It is commonly closely related to the thyroid gland, which may be the only point of attachment to normal structures of the neck, even when large [3]. Encapsulation is common, which facilitates complete removal. Even large lesions are relatively easily resected, although a lobe of the thyroid may need to be excised [4]. Recurrence following apparent complete excision is rare [4].

Clinical differentiation of cervical teratoma from cystic hygroma can be difficult because of similarities in patient age and sex, lesion size, localisation and clinical characteristics. Although lymphangiomas usually arise in the posterior triangle of the neck, precise origin is usually obscured by the size of the tumour. Imaging may help in differentiating the two tumour types, e. g. calcification may be seen in 50 % of teratomas on plain radiographs [4]. US and CT often show features common to both lesions and may not be diagnostic.

There have been few reports of the features of head and neck teratoma on MRI [5, 6], and its diagnostic use in these lesions has not been fully established. High signal intensity from fat on T1-weighted images may be helpful [5] but is not always present and, as this case shows, the appearances of a multiloculated cystic structure showing high signal on T2-weighted images may be indistinguishable from cystic hygroma.

In conclusion, imaging plays an important role in the assessment of neck masses in young children. US is used in the first instance to establish the presence of cystic spaces. If there is clinical and radiological doubt as to the diagnosis, or if imaging is required for surgical planning, then cross-sectional imaging is indicated. Although CT has the advantage of detection of calcification, MR, with its multiplanar capacity, high contrast resolution and lack of radiation, is the modality of choice.

References

1. Jordan RB, Gauderer MW (1988) Cervical teratomas: an analysis. Literature review and proposed classification. J Pediatr Surg 23: 583–591
2. Filston HC (1994) Haemangiomas, cystic hygromas, and teratomas of the head and neck. Semin Pediatr Surg 3: 147–159
3. Rothschild MA, Catalano P, Urken M, et al (1994) Evaluation and management of congenital cervical teratoma. Case report and review. Arch Otolaryngol Head Neck Surg 120: 444–448
4. Welch KJ (1986) The oropharynx and jaws. In: Welch KJ, Randolph JG, Ravitch MM, et al (eds) Pediatric surgery, vol 1, 4th edn. Year Book, Chicago, pp 513–515
5. Wiatrak BJ, Myer CM, Bratcher GO (1990) Report of a nasopharyngeal teratoma evaluated with magnetic resonance imaging. Otolaryngol Head Neck Surg 102: 187–191
6. Jaarsma AS, Tamminga RY, de Langen ZJ, et al (1994) Neonatal teratoma presenting as hygroma colli. Eur J Pediatr 153: 276–278