Carotid sheath lipoma: first case report in the English literature

S Parelkar, S Kapadnis, B Sanghvi, P Joshi, D Mundada, S Shetty, S Oak

King Edward Memorial Hospital, Mumbai, India

ABSTRACT
Lipomas are the most commonly encountered benign mesenchymal tumour, arising in any location where fat is normally present. Lipomas in the head and neck are rare in all age groups. Cases of vascular sheath lipomas in the femoral region have only been reported in adults. In children, vascular sheath lipomas have not been described to date. We report the first case of a carotid sheath lipoma in a seven-year-old boy. He had a non-tender soft mass with ill defined borders occupying the left upper part of the neck. Magnetic resonance imaging showed a mass at the bifurcation of the left common carotid artery without involving the same. The mass was hyperintense on T1 and T2 weighted sequences, suggestive of a lipoma. The lipoma was enucleated after incising the carotid sheath, safeguarding its contents. Histopathology confirmed it as a lipoma.

KEYWORDS
Lipoma – Carotid sheath – Femoral sheath – Mesenchymal tumour

Accepted 30 September 2012; published online 27 June 2013

CORRESPONDENCE TO
Prashant Joshi, Assistant Professor of Paediatric Surgery, King Edward Memorial Hospital, Acharya Dponde Marg, Parel, Mumbai – 400 012, India
E: pbjoshiisat@gmail.com

Lipomas are the most commonly encountered benign mesenchymal tumours, arising in any location where fat is normally present. Occurrence in the head and neck is relatively rare. It is most commonly found in the subcutaneous portion of the posterior aspect of the neck. Surgical excision here is challenging because of the proximity of vital structures in the neck. Knowledge of anatomy and meticulous surgical dissection are therefore essential. Until now, the only lipoma reported from a vascular sheath has been from the femoral sheath in an adult. We describe the first case of a carotid sheath lipoma in a child.

Case history
A seven-year-old boy presented in the department having experienced a gradually increasing swelling in the left upper part of the neck for the previous two years. Clinical examination revealed a painless, non-tender soft mass with ill defined borders occupying the left upper part of the anterior neck. The surface was smooth and the overlying skin was normal. Ultrasonography was suggestive of venous malformation. Magnetic resonance imaging (MRI) showed a well circumscribed mass lesion of 3.8 cm x 3.5 cm x 2 cm in the left submandibular region lying beneath the sternocleidomastoid muscle causing mild anterior displacement of the submandibular gland (Fig 1). The mass was hyperintense on T1 and T2 weighted sequences, suggestive of a lipoma. The mass was at the bifurcation of the left common carotid artery without involving the same. Superiorly, it extended up to the parapharyngeal space and inferiorly, up to the level of the third cervical vertebra.

The child was operated on through a left upper cervical transverse incision. The lipoma was dissected carefully. It was seen to arise from the carotid sheath near the bifurcation of the common carotid artery. The lipoma was enucleated after incising the carotid sheath and safeguarding its contents (Fig 2).

The histological findings grossly revealed a well encapsulated yellow-brown mass with a bosselated surface (Fig 3). On microscopy, clusters of mature adipocytes separated by loose fibrovascular stroma were suggestive of a lipoma (Fig 4). The patient had a very good recovery with satisfying neck contour. Recurrence was not observed six months after surgery.

Discussion
Lipomas are benign mesenchymal tumours that are histologically similar to mature adipose tissue but the presence of a fibrous capsule helps to differentiate them from simple fat aggregations. Only 25% of lipomas arise from the head and neck. Intracranial lipomas are very rare congenital malformative lesions, comprising less than 0.1% of intracranial tumours. Lipomas of the corpus callosum are found in 1 in 2,500 to 1 in 25,000 autopsies. Oral cavity lipomas comprise 1–5% of lipomas. Lipomas of the anterior neck are extremely rare; they can also originate in more atypical sites as long as adipose tissue is present. There is one report of an
intravascular femoral vein lipoma\textsuperscript{7} and also a single case of a lipoma arising from the femoral vascular sheath,\textsuperscript{8} both in an adult. However, a lipoma arising from the carotid sheath has not been described in the medical literature.

In 2002 Zhang and Lee studied fetal carotid sheaths.\textsuperscript{8} They observed that the carotid sheath was attached to the subcutaneous fatty tissue without any clear demarcation by a fascia. The developing fatty tissue provides a thick sheet extending dorsolaterally from the adventitia of the common carotid artery to the subcutaneous area. Thus, the adventitia of common carotid artery contains fatty tissue. This fatty tissue sheet was sandwiched by the pretracheal lamina containing the omohyoid muscle and the pretracheal lamina covering the scalene. Some subcutaneous fatty tissue is therefore likely to be adjacent to the carotid sheath.\textsuperscript{9} It is possible that the overgrowth of this tissue resulted in the lipoma in our patient.

Ultrasonography is useful as an initial imaging study in suspected neck lipomas.\textsuperscript{10} Computed tomography (CT) or MRI are helpful in further assessment.\textsuperscript{11} Compared with
CT and MRI, ultrasonography is quick, easy and less costly. However, the soft tissue characterisation is less specific with ultrasonography. On CT, lipomas have typical characteristics of homogeneous masses with few septations. MRI can also accurately diagnose lipomas. Moreover, the margin of a lipoma is defined clearly by MRI as a black rim, enabling lipomas to be distinguished from surrounding adipose tissue, a distinction that cannot be made in CT. In the index case, although ultrasonography was suggestive of venous malformation, high resolution MRI was diagnostic of a lipoma.

Most lipomas are well encapsulated and easily dissected from surrounding tissues. They recur locally in 5% of cases.12 The concept that lipomas can undergo malignant transformation to liposarcomas is no longer accepted. An original tumour is the most common explanation for the apparent ‘transformation’ of a lipoma to an atypical lipomatous neoplasm.13 Histologically, these tumours are completely benign but they can have local invasive and infiltrative behaviour.14 Regular follow-up appointments are recommended.

**Conclusions**

Carotid sheath lipomas are extremely rare in any age group and this is the first case that has been reported in the English literature.

**References**

1. Kransdorf MJ. Benign soft-tissue tumors in a large referral population: distribution of specific diagnoses by age, sex, and location. Am J Roentgenol 1995; **164**: 395–402.
2. El-Monem MH, Gaafar AH, Magdy EA. Lipomas of the head and neck: presentation variability and diagnostic work-up. J Laryngol Otol 2006; **120**: 47–55.
3. Som PM, Scherl MP, Rao VM, Biller HF. Rare presentations of ordinary lipomas of the head and neck: a review. Am J Neuroradiol 1986; **7**: 657–664.
4. Day A, Thomas P. Femoral sheath lipoma causing venous obstruction syndrome. Ann R Coll Surg Engl 2010; **92**: W21–W22.
5. Kim YH, Reiner L. Ultrastructure of lipoma. Cancer 1982; **50**: 102–106.
6. Ketonen LM, Hiwatashi A, Sidhu R, Westesson PL. Pediatric Brain and Spine. Berlin: Springer; 2005.
7. Som PM, Scherl MP, Rao VM, Biller HF. Rare presentations of ordinary lipomas of the head and neck: a review. Am J Neuroradiol 1986; **7**: 657–664.
8. Zhang M, Lee AS. The investing layer of the deep cervical fascia dies not exist between the sternocleidomastoid and trapezius muscles. Otalaryngol Head Neck Surg 2002; **127**: 452–454.
9. Miyake N, Hayashi S, Kawasaki T, et al. Fetal anatomy of the human carotid sheath and structures in and around it. Anat Rec 2010; **293**: 438–445.
10. Ahuja AT, King AD, Kew J, et al. Head and neck lipomas: sonographic appearance. Am J Neuroradiol 1998; **19**: 505–508.
11. Farkas ML, Gluckman JL, Shumrick KA. Parapharyngeal space tumors: an algorithm for evaluation and management. Laryngoscope 1994; **104**: 1,170–1,173.
12. Batsakis JG. Tumors of the Head and Neck. 2nd edn. Baltimore: Williams & Wilkins; 1979. pp360–364.
13. Weiss SW, Goldblum JR. Soft Tissue Tumors. 5th edn. St Louis, MO: Mosby; 2008. pp429–476.
14. Derin AT, Guney K, Turhan M, et al. Giant cervical lipoma invading carotid artery: a case report. Kulak Burun Bogaz Ihtis Derg 2009; **19**: 28–31.