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Head and Neck Lipomas: Sonographic Appearance

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PURPOSE: **The diagnosis of cervical lipoma may not always be clinically apparent, in which case patients are frequently referred for sonography. The purpose of this study was to document the sonographic features of head and neck lipomas.**

METHODS: **Twenty-five patients with soft-tissue masses in the neck had sonography as their initial imaging study. A lipoma was suspected on the basis of findings at clinical examination in only eight of these patients. Lipoma was confirmed by fine-needle aspiration cytology in 11 patients, by excision biopsy in five patients, by CT in two patients, and by clinical examination with clinical sonographic follow-up (6 months to 2 years) in seven cases.**

RESULTS: **Lipomas were well-defined (88%), compressible (100%), elliptical masses with the longest diameter parallel to the skin surface. All contained multiple echogenic lines parallel to the skin surface with no evidence of posterior enhancement or attenuation and no flow on color Doppler sonography. Compared with adjacent muscle, 76% of all lipomas were hyperechoic, 8% isoechoic, and 16% hypoechoic.**

CONCLUSION: **The characteristic sonographic appearance of head and neck lipomas is that of an elliptical mass parallel to the skin surface that is hyperechoic relative to adjacent muscle and that contains linear echogenic lines at right angles to the ultrasound beam.**

Lipomas are the most common benign mesenchymal tumor, arising in any location where fat is normally present. Thirteen percent of all lipomas are located in the head and neck region (1). Lipomas present most commonly in the fifth or sixth decade of life, and are multiple in 5% of patients but are uncommon in children (2).

Clinical examination alone is often insufficient to identify the nature and exact origin of the mass, in which case imaging is necessary, particularly when the tumor is deep seated. Despite the common nature of this tumor, sonographic descriptions are few and conflicting. This study is only the second comprehensive series restricted solely to head and neck lipomas. The sonographic appearance of lipomas documented in this series and that previously reported by Gritzman et al (3) are remarkably similar. We therefore believe that although the sonographic appearance of lipomas elsewhere in the body is varied, in the head and neck, their presentation is constant and quite characteristic.

We describe these characteristic sonographic findings in 25 patients with lipomas in the cervical soft tissues and provide the differential diagnoses.

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Methods

Twenty-five patients with soft-tissue masses in the neck had sonography as their initial imaging study. There were eight female and 17 males patients, with an age range of 16 to 72 years. The diagnosis of lipoma was suspected on the basis of clinical examination in only eight patients.

Sonography was performed with a 5- to 10-MHz linear array transducer (ATL 3000, HDI, Bothell, Wash) or a 10-MHz mechanical sector scanner (Aloka 650, Tokyo, Japan). All the lesions were evaluated for location, shape, size, border, internal architecture, distal enhancement, colorflow, and echogenicity relative to adjacent muscle.

The diagnosis of lipoma was confirmed by fine-needle aspiration cytology in 11 patients, by excision biopsy in five patients, by computed tomography (CT) in two patients, and by clinical examination with clinical/sonographic follow-up (6 months to 2 years) in seven cases.

Results

Location

Nineteen lipomas were located in the anterior and lateral soft tissues of the neck, of which 10 (40%) were located in the lateral cervical soft tissues, seven (28%) in the supraclavicular fossa, and one (4%) in the submental region. There was one intraparotid lipoma and six (24%) that were located posteriorly at the nape of the neck.

Echogenicity

Overall in the neck, 19 lipomas (76%) were hyperechoic (Fig 1), two (8%) were isoechoic (Fig 2), and four (16%) were hypoechoic (Fig 3) relative to adja-

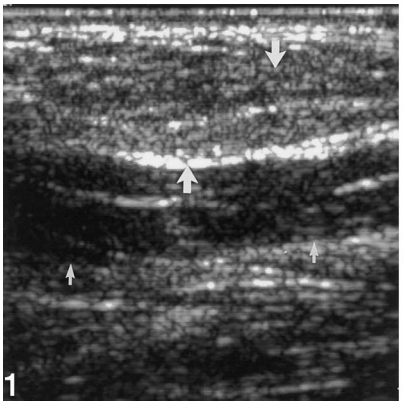


FIG 1. Longitudinal sonogram shows a lipoma (*large arrows*) that is hyperechoic relative to adjacent muscle (*small arrows*).

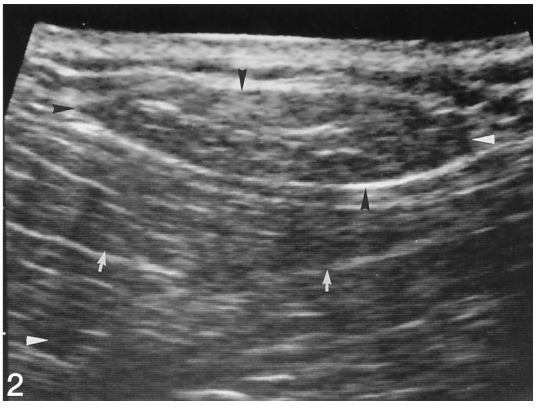


FIG 2. Longitudinal sonogram shows a lipoma (*arrowheads*) that is of similar echogenicity as that of adjacent muscle (*arrows*).

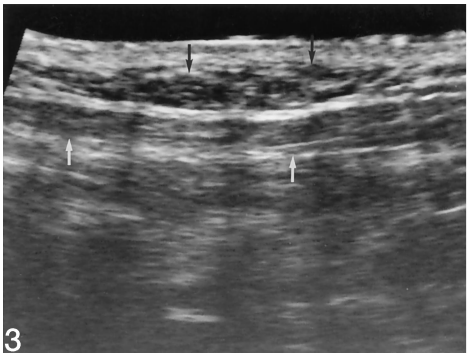


FIG 3. Longitudinal sonogram shows a lipoma (*black arrows*) that is hypoechoic relative to adjacent muscle (*white arrows*).

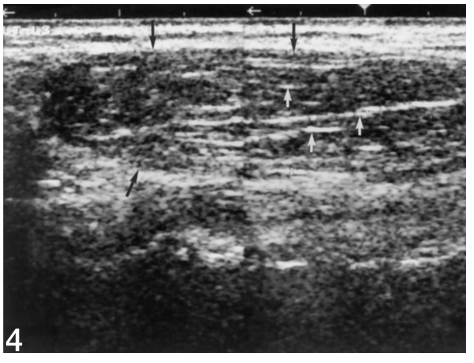


FIG 4. Longitudinal sonogram shows a lipoma (*black arrows*) with echogenic streaks parallel to the skin surface (*white arrows*).

cent muscle. However, of the 19 lipomas in the anterior and lateral soft tissues of the neck, 17 (89%) were hyperechoic and two (11%) were isoechoic. Of the six lipomas at the nape of the neck posteriorly, four (67%) were hypoechoic and only two (33%) were hyperechoic.

Shape and Size

Twenty-two lipomas (88%) were elliptical (Figs 2–4) and three (12%) were ovoid. In all cases, the longest diameter ran parallel to the skin surface. The lipomas ranged in size from 20 × 10 mm to 40 × 30 mm.

Internal Architecture

All lipomas had a heterogeneous appearance with multiple fine echogenic lines parallel to the skin surface (Fig 4).

Border

Twenty-two lipomas (88%) were well defined (Fig 2) with a clearly identified capsule; three (12%) had an incomplete capsule.

Distal Enhancement

None of the lipomas displayed posterior enhancement or attenuation.

Compressibility

Except for the intraparotid lipoma, all masses were compressible with moderate transducer pressure.

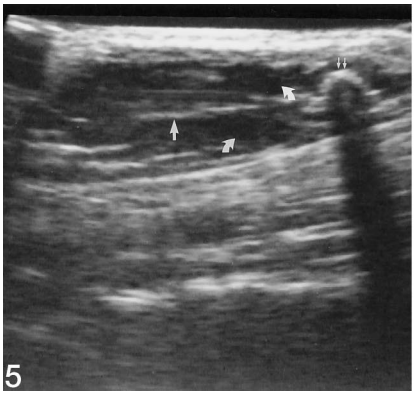
Color Flow

None of the lipomas showed any internal vascularity.

Discussion

Descriptions of the sonographic appearance of lipomas are conflicting. Initially, they were reported to be sonoluscent with a few internal echoes (4, 5), then Goldberg (6) described their internal echogenicity and poorly defined contours. The reason for these conflicting reports may be due to the fact that most investigators group lipomas located in various parts of the body under one category such as those found in the extremities, thorax, and abdominal walls (2, 7), renal angiomyolipomas, adrenal myelolipomas, pelvic dermoids, renal sinus lipomatosis, and pelvic lipomatosis (7).

With the availability of high-frequency high-resolution transducers, the internal architecture and appearance of lipomas are now better understood. Our findings revealed that head and neck lipomas are compressible, well-defined (88%) elliptical masses parallel to the skin surface (88%), are hyperechoic relative to adjacent muscle (76%), contain linear echogenic lines at right angles to the ultrasound beam (100%), and display no distal enhancement or attenuation (100%). Because Gritzman et al (3) reported a similar striped appearance, echogenic nature, and ovoid shape of cervical lipomas, the presence of a mass with the above features should be considered characteristic of a lipoma. Fine-needle aspiration cytology or CT may be indicated if the diagnosis is at odds with the clinical impression or if the entire



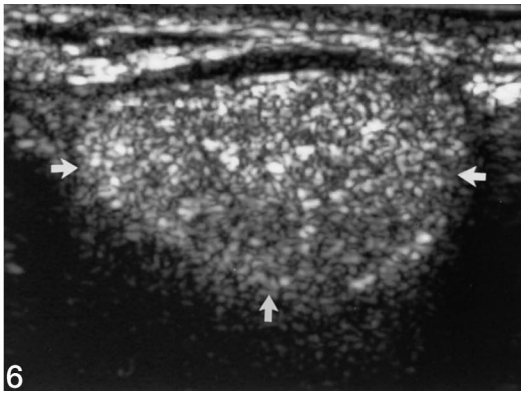
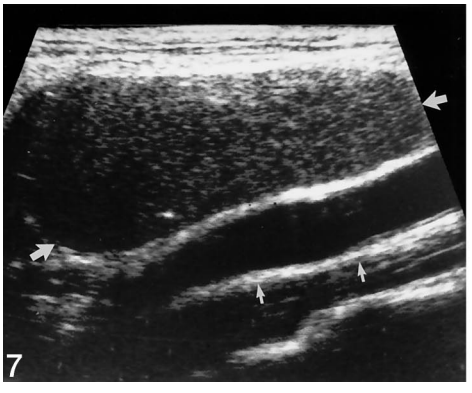


FIG 5. Longitudinal sonogram of a hemangioma containing parallel streaks (*large straight arrow*). Note, however, the vascular sinusoidal spaces (*curved arrows*) and the presence of the phlebolith (*small arrows*).

FIG 6. Transverse sonogram shows hyperechoic epidermoid cyst in the sternal notch (*arrows*), but note the absence of the parallel echogenic streaks characteristic of a lipoma.



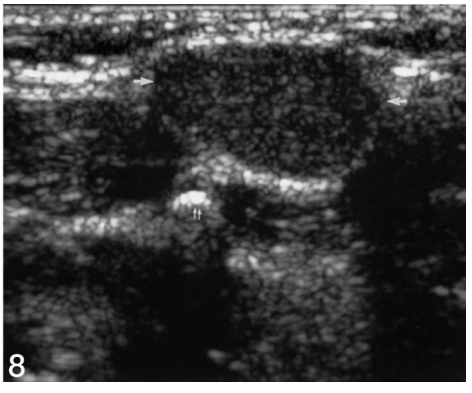


FIG 7. Longitudinal sonogram of a branchial cyst (*large arrows*) shows its echogenic nature; however, no parallel echogenic lines are seen within it. *Small arrows* identify the common carotid artery.

FIG 8. Longitudinal sonogram of a thyroglossal cyst (*large arrows*) shows uniform internal echoes but no parallel echogenic lines. *Small arrows* identify the hyoid.

extent/outline of the lipoma is not delineated on the sonogram. On CT scans, a lipoma is isodense with normal subcutaneous fat: the capsule may be barely visible (8) or adjacent mass effect may be the only clue to its presence.

Lipomas should not be confused with Madelung disease (9), also known as Launois-Bensaude disease (10), which occurs in middle-aged European men of Mediterranean descent with a history of alcohol abuse. In these patients, fat accumulates in the cervical and upper dorsal regions, abdomen, and groin. Although it is uncommon in the Chinese population, in our experience, the fatty deposits are of mixed echogenicity, with linear echogenic lines parallel to the skin surface and with no evidence of a capsule. Although sonography is able to depict the presence of fat in the soft tissues, it is unable to show the depth, extent of infiltration, and airway compromise, if any.

The differential diagnosis of lipoma includes epidermoid cysts, branchial cysts, thyroglossal cysts, hemangiomas, lymph nodes, and normal muscle. To an inexperienced sonographer, the lower sternomastoid muscle, when seen in the transverse plane, may appear similar to a lipoma; however, the fascicular sheaths have a more organized concentric distribution and the sternomastoid portion has a constant, lower antero/central tendon, with the cleidomastoid portion identified only occasionally. Scanning in the longitudinal plane immediately clears any confusion, as the long almost parallel fascicles become clearly visible.

Hemangiomas may have a similar shape and echogenic lines but are hypoechoic with a heterogeneous echo pattern and contain cystic and sinusoidal spaces as well as the occasional phlebolith (11) (Fig 5). Epidermoid cysts are commonly seen in the submental, submandibular area (12) and sternal notch. They are well defined, hyperechoic relative to adjacent muscle with a uniform echogenicity, and may exhibit distal enhancement (Fig 6). The linear echogenic lines so characteristic in a lipoma are not seen. Branchial cysts are typically located in the posterior submandibular space at the angle of the mandible (13), and thyroglossal cysts usually are seen in the midline below the hyoid. The position of these lesions together with their well-defined cystic nature confirms the diagnosis. However, some lesions may contain cellular material and cholesterol crystals (14), making them uniformly echogenic, resembling a solid mass (Figs 7 and 8). When these lesions occur in an uncharacteristic site, they may be confused with a lipoma. Once again, in these cases it is the absence of echogenic lines that distinguishes them from a lipoma. Normal nodes in the neck are hypoechoic, with a echogenic hilum and a maximum transverse diameter of 8 mm (15). Abnormal nodes are round, hypoechoic, and may even display posterior enhancement, particularly the lymphomas (16). Nodes from papillary carcinoma of the thyroid are hyperechoic relative to adjacent muscle; however, they frequently show punctate calcification and intranodal necrosis (17). None of the nodes have echogenic lines parallel to the skin surface, which are characteristic of lipomas.

Conclusion

Head and neck lipomas are best diagnosed clinically; palpation reveals a painless, mobile, and well-delineated soft mass. Their characteristic sonographic appearance is that of an elliptical mass parallel to the skin surface that is hyperechoic relative to adjacent muscle and that contains linear echogenic lines at right angles to the ultrasound beam.

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