Skeletal Radiol (1990) 19:363–365

Skeletal Radiology

Deep-seated soft tissue leiomyomas

Report of four patients

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Abstract. The radiologic and histologic findings of four deep-seated, soft tissue leiomyomas are reported. Clinically and radiologically, they mimicked soft tissue sarcomas because of their location and rich vascularization.

Key words: Leiomyoma – Angioleiomyoma – X-ray – Computed tomography – Soft tissue – Tumor

Soft tissue leiomyomas are benign smooth muscle tumors, in most cases originating from blood vessels. They may occur anywhere in the body and are commonly painful [4, 6]; the majority are small and subcutaneous. Isolated instances of leiomyomas occurring in the deep parts of an extremity have been reported [2, 5]. The tumor size and rich vascularization may mimic soft tissue sarcoma in such patients [3].

Reports of benign smooth muscle tumors in the radiological literature are rare, and none refers to their computed tomography (CT) appearance. We therefore present four patients with deep-seated, benign smooth muscle tumors examined by conventional radiography and CT.

Material and methods

Four patients with deep-seated, benign smooth muscle tumors were treated during the period 1984 to 1988. All patients were examined preoperatively with conventional radiography and CT before and after IV contrast administration. The diagnosis was established by histopathologic examination of the operative specimen, with sections stained by haematoxylin-eosin and van Gieson. All patients underwent immunohistochemical examination by the indirect peroxidase method for desmin and for muscle-specific actin. Case 1 was also examined by electron microscopy.

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Case reports

Case 1

A 74-year-old man presented with a 2-month history of a palpable mass in the right ischiorectal fossa. At CT a 6-cm large perianal mass was found on the right side. Following contrast administration, irregular enhancement suggested a vascular tumor (Fig. 1). After a diagnostic open biopsy, the tumor was treated by marginal resection.

The tumor measured $10 \times 10 \times 6$ cm and was richly vascularized, solid, and well circumscribed. Microscopic examination revealed a benign spindle cell tumor with numerous vessels and extensive hyalinization. The vessels were thick-walled and slitlike. The electron microscopic picture was consistent with that of a smooth muscle tumor. The tumor cells had spindle-shaped or lobulated nuclei, tight external lamina, and smooth muscle filaments. Pinocytosis was seen in many areas. The histologic diagnosis was benign smooth muscle tumor, angioleiomyoma.

Case 2

A 19-year-old woman presented with a 3-year history of a 3-cm large, deep-seated mass in the left thigh, causing intermittent pain on exertion. On plain radiographic examination, a loculated soft tissue calcification was present adjacent to the anteromedial aspect of the femoral shaft, suggestive of myositis ossificans. Upon CT examination no additional abnormalities were seen. Marginal excision was performed, the lesion being located in the vastus intermedius muscle (Fig. 2).

The surgical specimen was a $6 \times 3.5 \times 2.5$ cm solid tumor containing focal calcifications. Histologically, it was composed of smooth muscle tissue with rich vascularization. The vessels were often thick-walled. Focal hyalinization, calcification, and bone metaplasia were common findings. The histologic diagnosis was angioleiomyoma with regressive features.

Case 3

A 29-year-old woman presented with a 1.5-year history of a lump in the left supraclavicular fossa without pain. Upon CT examination, a 7-cm large, well-defined, supraclavicular mass was found

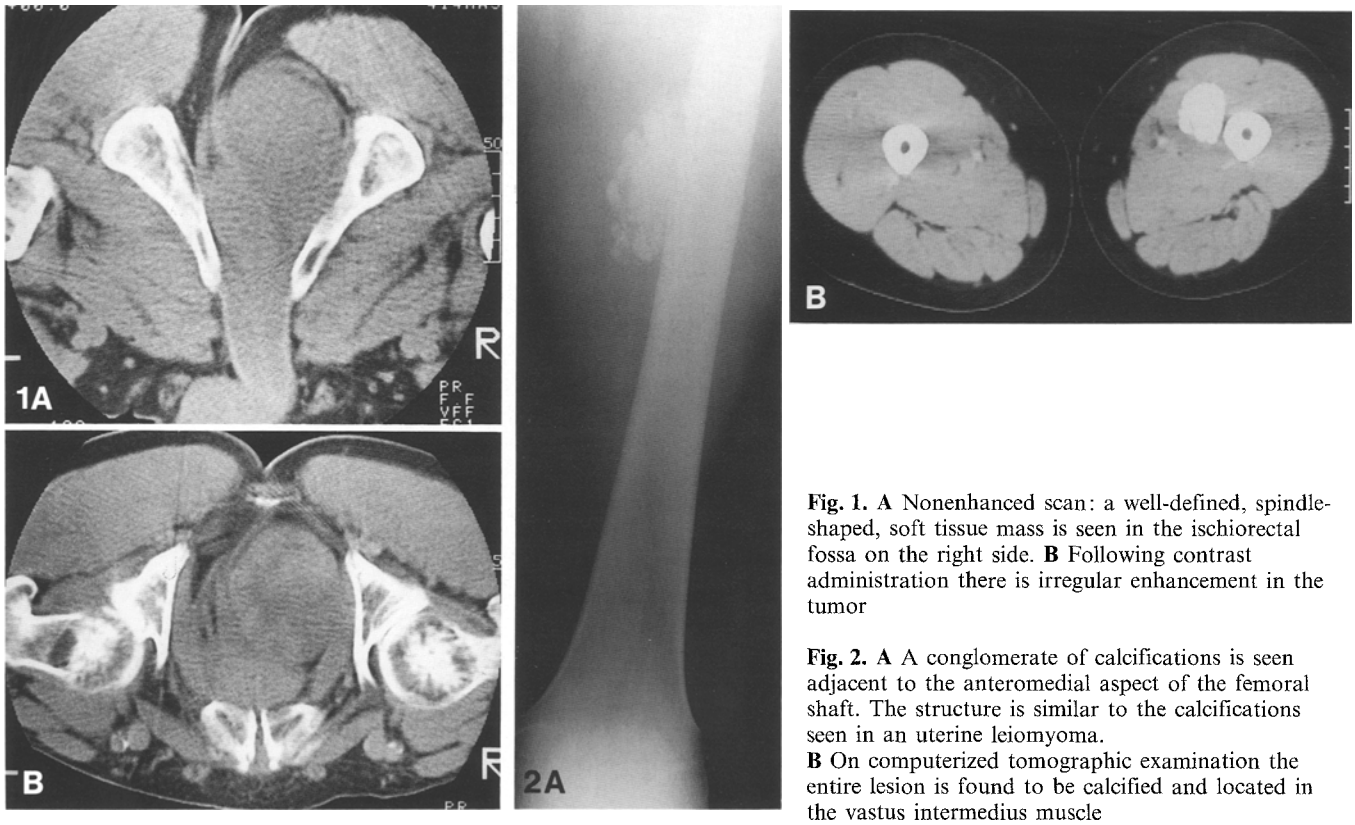


Fig. 1. A Nonenhanced scan: a well-defined, spindle-shaped, soft tissue mass is seen in the ischiorectal fossa on the right side. **B** Following contrast administration there is irregular enhancement in the tumor

Fig. 2. A A conglomerate of calcifications is seen adjacent to the anteromedial aspect of the femoral shaft. The structure is similar to the calcifications seen in an uterine leiomyoma.
B On computerized tomographic examination the entire lesion is found to be calcified and located in the vastus intermedius muscle

with moderate contrast enhancement in the periphery. A network of vessels was evident in the upper part of the tumor (Fig. 3A, B). The tumor was located within the upper section of the trapezius muscle and was removed by wide excision.

The tumor was $8 \times 6 \times 4$ cm large, solid, and well-circumscribed. Microscopy demonstrated benign spindle-formed tumor cells with rich vascularization (Fig. 3C) and extensive hyalinization. The vessels were often thick-walled. The tumor was diagnosed as an angioleiomyoma.

Case 4

A 20-year-old man had noted a painless mass posteriorly in the left thigh 2 months before admission. Upon CT examination a mass was demonstrated in the left semitendinosus muscle with moderate contrast enhancement of its periphery (Fig. 4). The tumor was excised together with the surrounding muscle.

The specimen measured $20 \times 8 \times 5$ cm and was situated intramuscularly. It contained a deep-seated, solid, grayish-white tumor with focal bleeding. The tumor size was $9 \times 5 \times 4$ cm. Histopathologic examination showed a smooth muscle tumor with focally extensive vascularization. Rare mitotic figures were observed but no cellular atypia or nuclear pleomorphism. Immunohistochemical examination revealed a strongly positive reaction for desmin in the tumor cells and blood vessel walls (Fig. 4B). The histologic diagnosis was leiomyoma.

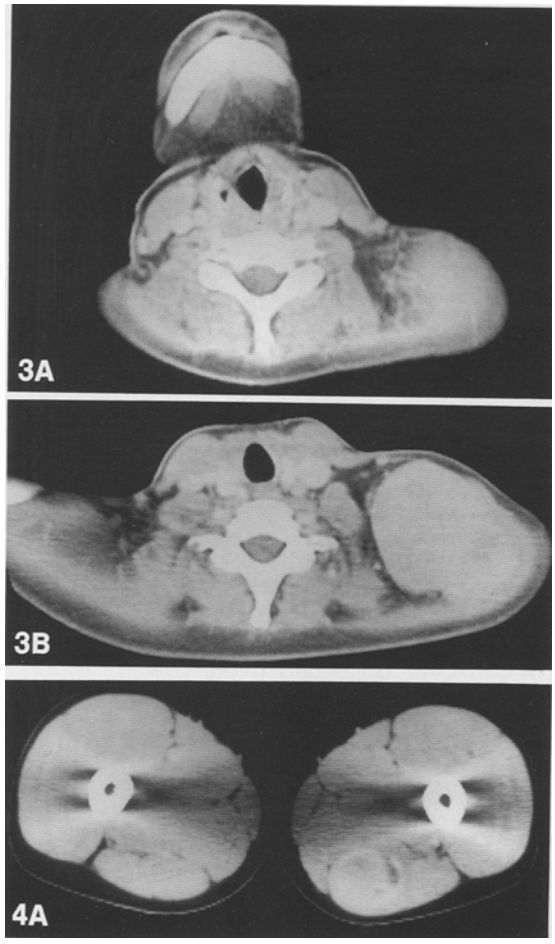
Discussion

The most common location for soft tissue leiomyomas is in the subcutaneous tissue [2, 5]. Only isolated instances situated beneath the deep fascia have been described before [2, 3, 5]. Deep-seated, soft tissue leiomyomas can be larger than cutaneous and subcutaneous leiomyomas and often demonstrate a rich vascularization [2, 3, 5]. The size, site, and vascularity mimicked soft tissue sarcoma in the preoperative assessment in three of our patients.

Macroscopically, all these leiomyomas were nodular, well-circumscribed, and grayish-white. At histologic examination, all tumors were composed of benign smooth muscle tissue without cellular atypia. Despite the rare mitotic activity observed in case 4, this tumor was considered benign. Cases 1, 2, and 3 showed prominent vascularization with numerous, thick-walled vessels, often arranged in the circumferential fashion typical of angioleiomyoma. All tumors gave a positive reaction for intermediate cytofilament by the indirect peroxidase method for desmin and muscle-specific actin [8], indicating a tumor of smooth muscle origin.

Scattered calcifications have been reported in isolated instances of deep-seated leiomyoma [2]. In the radiological literature there are also a few reports of "mulberry" calcification in childhood leiomyomas similar to those in uterine leiomyomas. In these cases no comments were made as to whether the tumor was of vascular origin or not [1, 7]. In case 2 in the present study the lesion was calcified in a similar way, representing dystrophic calcifications in a necrotic tumor. The preoperative diagnosis was myositis ossificans. In the other patients the CT appearance with irregular or peripheral contrast enhancement was indistinguishable from other vascularized lesions including soft tissue sarcomas.

We propose that benign smooth muscle tumors be included in the differential diagnosis of large, vascular, soft tissue tumors.



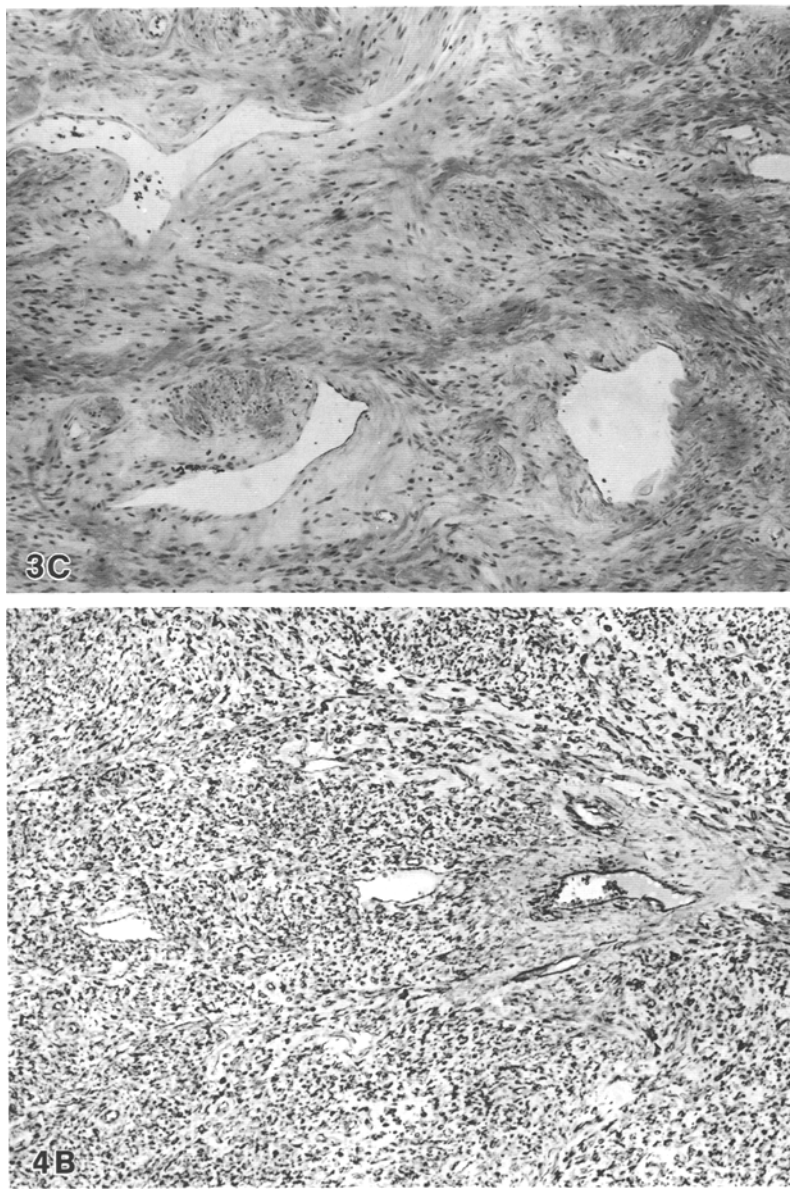


Fig. 3. A, B Computed tomographic examination with contrast enhancement. **A** In the upper part of the mass, a network of vessels is evident. **B** In the central portion of the lesion, irregular contrast enhancement is seen, suggesting a vascularized lesion. The mass was located within the trapezoid muscle. **C** Representative section with smooth muscle cells and thick-walled vessels. van Gieson, ×40

Fig. 4. A On computed tomogram following contrast administration, enhancement of the tumor periphery is evident. **B** Strongly positive desmin reaction in smooth muscle tumor cells and blood vessel walls. Indirect peroxidase method. ×40

References

1. Caffey J (1972) Pediatric X-ray diagnosis, 6th edn. Year Book Medical, Chicago, p 1347
2. Duchateau J, Zielonka E, Guelinckx PJ (1987) Chronic pain: illusion or pathology? A case report of a vascular leiomyoma in the leg. Br J Plast Surg 40:536
3. Enzinger FM, Weiss SW (1988) Benign tumors of smooth muscle. In: Enzinger FM, Weiss SW (eds) Soft tissue tumors, 2nd edn. CV Mosby, St. Louis, p 383
4. Freedman AM, Meland NB (1989) Angioleiomyomas of the extremities: report of a case and review of the Mayo Clinic experience. Plast Reconstr Surg 83:328
5. Goodman AH, Briggs RC (1965) Deep leiomyoma of an extremity. J Bone Joint Surg [Am] 47:529
6. Hachisuga T, Hashimoto H, Enjoji M (1984) Angioleiomyoma. A clinicopathologic reappraisal of 562 cases. Cancer 54:126
7. Ledesma-Medina J, Oh KS, Girdany BR (1980) Calcification in childhood leiomyoma. Radiology 135:339
8. Lundgren L, Seidal T, Kindblom LG, Angervall L (1989) Intermediate and fine filaments of vascular leiomyomas (angiomyoma), leiomyoma, and leiomyosarcoma of large veins. AP MIS 97:637