

# Giant cervical lipoma invading carotid artery: a case report

## Karotis arter invazyonu gösteren dev servikal lipoma: Olgu sunumu

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Lipomas are one of the most frequently encountered benign tumors in any location. There is limited information about head and neck lipomas in the literature and most data is in the form of case reports. Lipomas can rarely reach gigantic sizes and can invade surrounding tissues, especially skeletal muscles, and in this case they are called infiltrating lipomas. In this manuscript we report a case of cervical giant lipoma surrounding and infiltrating the common carotid artery which was treated by grafting carotid artery, and our diagnostic work-up and treatment procedure are discussed in the light of the literature.

**Key Words:** Carotid grafting; giant lipoma; infiltrating lipoma; neck.

Lipomalar herhangi bir yerleşimde olabilen ve en sık görülen benign tümörlerdendir. Baş boyun lipomaları hakkında literatür bilgileri sınırlıdır ve başlıca veriler olgu sunumu şeklindedir. Lipomalar nadir olarak dev boyutlara ulaşabilir veya iskelet kası başta olmak üzere çevre dokuları invaze edebilir ve bu durumda infiltran lipomalar olarak adlandırılırlar. Bu makalede, -bildiğimiz kadarıyla literatürde ilk olarak- karotis arter invazyonu gösteren bir dev lipoma olgusunda karotis arteri greftleyerek uyguladığımız tanı ve tedavi protokolü, literatür eşliğinde sunuldu.

**Anahtar Sözcükler:** Karotis greftleme; dev lipoma; infiltratif lipoma; boyun.

Lipomas are the most common benign mesenchymal tumors with a prevalence rate of 2.1 per 100 people.<sup>[1]</sup> Most of them are small, weighing only a few grams and they are usually less than 2 cm<sup>[1]</sup> in dimension. However, the presentation of a lipoma in the head or neck is extremely rare. Only 13% of the lipoma cases were reported to involve the head and neck region and the major site of localization is the posterior triangle.<sup>[2]</sup> Rarer are the giant lipomas in this region,<sup>[2,3]</sup> especially those of infiltrating forms.<sup>[4]</sup> Here we present a case of a giant form surrounding the left common carotid artery and slightly extending to the upper mediastinum. Treatment and diagnostic strategies for infiltrating

lipomas are discussed below with references to the literature.

### CASE REPORT

A 57-year-old male presented with a large left cervical mass. The patient had been aware of the swelling for one year and it has been growing more rapidly for the last three months. He had not experienced any pain or tenderness. The physical examination revealed a diffuse enlargement of the left cervical area beginning from the mandible and extending superiorly to the supraclavicular, inferiorly the suprasternal region and posteriorly to the posterior cervical triangle. The trachea was deviated

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towards the counter lateral neck from the midline. Other otorhinolaryngologic and systemic examinations were normal. The Doppler ultrasound did not show any flow abnormalities in the major vascular system. A neck and thorax computed tomography (CT) showed a heterogeneous mass in lipoid density surrounding the common carotid artery and an intratumoral septation was seen. Pathological contrast enhancements of the septations were present. The mass was extending to the supra-aortic plane in the upper mediastinum. Its greatest dimension was calculated as 110 mm. These tomographic findings suggested a liposarcoma (Fig. 1). The Fine needle aspiration biopsy was nonspecific, therefore an incisional biopsy was performed and a lipoma was diagnosed.

Surgery was planned for this patient. During the operation, a giant lipomatous lesion deep from under the sternocleidomastoid muscle was observed. The mass depleted constricted the internal jugular vein laterally and it was extending from the submandibular region to the substernal plane. The tumor was removed in a monoblock fashion from the posterolateral neck and upper mediastinum. However, while dissecting the tumor from the common carotid artery, we observed that the mass was firmly attached to the whole common carotid wall by fibrous bands (Fig. 2). During the dissection in the lower  $\frac{1}{3}$  of the artery, a sudden rupture has occurred without permitting a primary saturation for the lesion destructing the medial muscular layer of the common carotid wall. In order to avoid

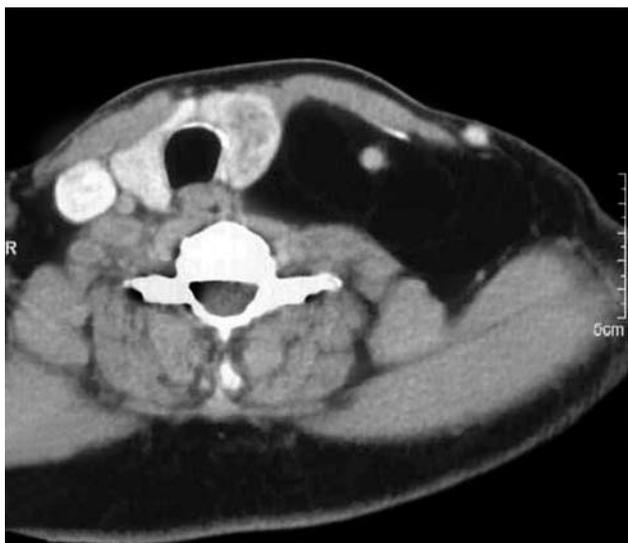


Fig. 1. Computed tomography demonstrating deep seated, heterogeneous mass surrounding the carotid artery.

serious bleeding postoperatively, this part of the common carotid artery was grafted with a pTFE (polytetrafluoroethylene) vascular graft 8 mm in diameter and 8 cm in length (Fig. 3, 4). We used a carotid shunt during this procedure in order to avoid the decrease of cerebral perfusion. After the tumor -with a mass of 17x13x10 mm in dimension and weighing 262 gr- was removed from the neck, the skin was closed in anatomic layers. No complications occurred after the operation and the patient was discharged from the hospital in the seventh day. A written consent was also obtained from the patient in order to publish his diagnostic and treatment work-up for scientific purposes.

Pathological examination of the specimen proved the lesion to be a lipoma with an infiltration into the medial muscular layer of the carotid artery. The patient has been under control for nine months. Clinical examinations and the postoperative CT showed no signs of recurrence (Fig. 5). The Doppler ultrasonography (USG) also confirmed that the carotid graft remains patent.

## DISCUSSION

Lipomatous tumors are the most frequently encountered soft tissue tumors in the whole body and classified in two distinct groups as benign and malignant.<sup>[5]</sup> Benign lipomatous tumors are subclassified according to their histological features and growth pattern into classic lipoma (solitary or multiple), fibrolipoma, angiolipoma, infiltrating lipoma, hibernoma, pleomorphic lipoma, lipoblastomatosis, and diffuse lipoblastomatosis.<sup>[4]</sup> Lipomas can also be subclassified according to their dimensions: "Giant lipoma" is defined as a lesion measuring at

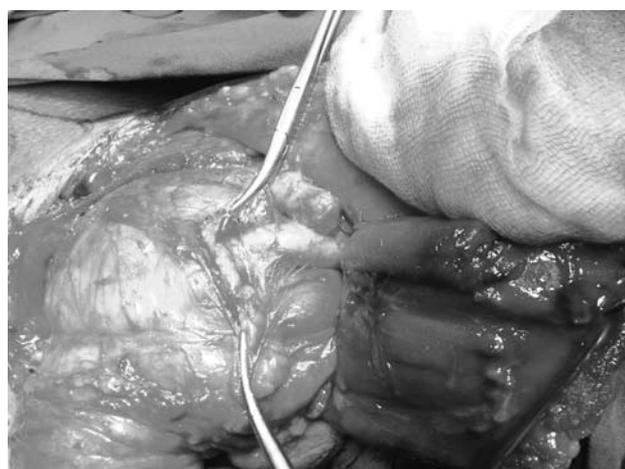


Fig. 2. Peroperative photograph of the lesion which was firmly attached the common carotid artery by fibrous Bands.



*Fig. 3. Lipoma dissected from the carotid wall which has a weak medial vascular layer.*

least 10 cm in one dimension or weighing a minimum of 1000 g.<sup>[6]</sup> Large lipomas, as large as 55x38 cm (24.950 g), have been reported in the literature related to this subject.<sup>[2,7,8]</sup>

Another categorization is made according to the localization of the lipoma as superficial or deep. All lipomas beneath the superficial fascia are named as deep-seated lesions.<sup>[9]</sup> Only 1-2% of lesions being deep seated according to the study about the largest series of lipomas to date, shown by Myhre-Jensen,<sup>[10]</sup> they are less common than their superficial counterparts. The larger size of these deep lipomas is often associated with the involvement of both intra and intramuscular tissues, and the term infiltrating lipoma has been applied to these lesions.<sup>[10]</sup>

The clinical evaluation of superficial lipomas is accurate and sufficient for diagnosis in up to 85% of the cases.<sup>[1,9]</sup> This ratio of clinically determined diagnoses is in contradiction with the deep-seated lipomas for which the clinical evaluation can only indicate a nonspecific mass. Unlike the lipoma, the infiltrating variant is not encapsulated; it is extensively involving the deep soft tissues, muscles, nerves, or synovium.<sup>[10]</sup> The high rate of recurrence ( $\leq 60\%$  of the reported head and neck cases) is perhaps attributable to the difficulties in radical excision.<sup>[11]</sup>

An accurate differential diagnosis should be made for these deep seated lipomas for a distinction from a liposarcoma. It has been suggested that lipomas seated in the depth of head and neck regions should be regarded as well-differentiated liposarcomas.<sup>[12]</sup> Moreover, if invasion is detected



*Fig. 4. Grafted carotid artery in the inferior 1/3 part.*

during dissection, a liposarcoma should be considered in differential diagnosis, because most of the lipomas are well encapsulated and easily dissected from surrounding tissues.<sup>[12]</sup>

Computed tomography and magnetic resonance (MR) imaging of soft tissue lipomas reveal a mass of homogenous adipose tissue in 11-12% of the cases.<sup>[13,14]</sup> Hounsfield unit measurements of soft-tissue lipomas are usually between  $-65$  and  $-120$ , although the value varies by the specific body location and a direct comparison with the attenuation of surrounding normal fat is often helpful.<sup>[14,15]</sup> The cases in which the entire lesion is composed of only adipose tissue allow a confident diagnosis of lipoma at CT or MR imaging, because well-dif-



*Fig. 5. Postoperative computed tomography after nine months.*

differentiated liposarcomas do not demonstrate this homogeneous appearance.<sup>[9]</sup> Heterogeneous lipomas can not be distinguished from well-differentiated liposarcoma through imaging alone. Murphey et al.<sup>[9]</sup> and others suggest a biopsy directed at these non-adipose regions, particularly if nodular or globular, both to diagnose well-differentiated liposarcomas and to also exclude the possibility of dedifferentiation.<sup>[9,16,17]</sup>

In the case we presented, the CT imaging demonstrated a thick intramural septation with a non-homogenous presentation considered suspicious of a well-differentiated liposarcoma; so an incisional biopsy was performed which indicated the lesion to be a lipoma.

The primary treatment option for infiltrating lipomas and liposarcomas is the complete surgical removal of the mass. This complete surgical excision is mandatory because of the infiltrative nature and potentially high rate of recurrence of these tumors after inadequate surgery.<sup>[8]</sup> However, an involvement of the adjacent soft-tissues including the vessels and nerves make the total resection of the mass extremely difficult. Radiotherapy and chemotherapy may be added as adjuncts to surgical excision for liposarcomas but they seem to have a low sensitivity to these.<sup>[18]</sup> Recurrence is common in deep-seated liposarcomas and infiltrating lipomas.<sup>[19]</sup> The recurrence is related to an incomplete excision and the tumor tissue left behind at the time of surgery. Since the recurrence may take up to five to ten years following the initial excision, a close follow-up of the patient is strongly recommended.<sup>[8]</sup>

In conclusion, among the head and neck lipomas infiltrating forms are also rare and there are some difficulties for diagnosis and treatment planning. Lipomas must be distinguished from well-differentiated liposarcoma and surgical plan must be done in the mirror of imaging techniques.

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