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Surgical excision of a lobular capillary hemangioma of the upper lip after percutaneous embolization: A case report

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ABSTRACT

A 22-year-old male presented with a nodular subcutaneous lesion on the left upper lip. Ultrasound examination of the superficial tissues (Ecography) revealed a heterogeneously hyperechoic formation with small-caliber, high-flow vessels embedded in a probable adipose component. The suspected diagnosis was a hemangiomatous neoplasm. Given the lesion's vascular nature and its location in a highly delicate area, a percutaneous embolization was performed prior to surgical excision to reduce intraoperative bleeding risk. Surgery was subsequently carried out without complications. Post-operative istopathological analysis confirmed the diagnosis of lobular capillary hemangioma (LCH), a benign vascular tumor that primarily affects the skin and mucous membranes. LCH is often associated with local trauma and is characterized by rapid growth, which may raise suspicion for malignancy. While surgical excision remains the definitive treatment, the vascular nature of the lesion poses a risk of significant hemorrhage, particularly in highly vascularized regions such as the face and oral cavity. This case highlights the importance of preoperative embolization as a valuable adjunct in the surgical management of LCH. By reducing blood flow to the lesion, embolization minimizes intraoperative bleeding, facilitates complete excision, and improves surgical outcomes. The use of this technique is particularly advantageous in challenging anatomical sites where excessive bleeding could complicate the procedure. Further studies are warranted to explore the broader applicability of embolization in the treatment of vascular tumors in sensitive regions.

1. Introduction

Lobular Capillary Hemangioma (LCH) is a benign vascular tumor affecting skin and mucous membranes [1,2].

It is also identified as Pyogenic Granuloma (PG), so named by Hartzell in 1904, although it is not related to pus and does not have the histological appearance of granuloma [3,4,5].

It predominantly affects women to men in a 2:1 ratio and the peak incidence occurs in the second decade of life [4,6].

It manifests itself in a sessile or exophytic and pedunculated form with a smooth or lobulated, compressible, asymptomatic, and painless surface on palpation [4,6].

Often occurs profuse bleeding due to minor trauma during chewing. It is characterized by an initial phase of rapid growth, followed by stabilization, and can occasionally regress [3].

Histologically, the lesion shows connective tissue with a distinct lobular structure with a central vessel and an aggregate of well-formed capillaries in the periphery [3]. At the oral level, it is localized in most cases (75–77 %) at the gingival level, the other areas less frequently affected are the lips, tongue, oral mucosa, and palate [6,7,8,9].

The main etiological factors are traumas, low-grade trauma, or chronic irritation associated with poor oral hygiene contribute to the growth and development of the oral LCH. Some authors also argue that it is the result of hormonal changes, estrogens, and sex hormones, especially during pregnancy, and the intake of drugs is associated with some variants of LCH (antiretroviral, antineoplastic, immunosuppressive) [10].

LCH clinically enters a differential diagnosis with peripheral giant cell granuloma, metastasis of malignant tumors, hemangioma, inflammatory gingival hyperplasia, non-Hodgkin's lymphoma, Kaposi's sarcoma, peripheral ossifying fibroma [11]. The definitive diagnosis is histological.

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2. Case report

The patient, a 22-year-old male, refers to our clinic presenting a hemangiomatous swelling involving the left half of the upper lip. The young patient is in good health and denies allergies and medication intake. He does not smoke and is not an alcohol abuser.

He reports the appearance of the lesion a couple of years ago, following a traumatic event, with a progressive increase in volume and often subject to bleeding.

On extraoral examination, the malformation appears smooth, erythematous, and not painful on palpation.

The preliminary examinations included an echography of the superficial tissues in which an unevenly hyperechoic formation of 27×15 mm was observed [Figs 1–2], containing some small caliber high-flow vessels immersed in a probably adipose component.

We opted to perform a microembolization of the malformation given the high-flow vascular component, which could cause excessive bleeding during surgery, with a consequent increase in surgical risk.

The vascular surgeon performed a percutaneous embolization of the swelling through a right femoral access and a selective angiographic study of the neoformation was performed with a triple coaxial catheter.

This malformation was embolized with a mixture of Glubran and ultrafluid Lipidol in a ratio of 1: 2 to the total dose of 0.15 cc. [Figs 3–4-5–6].

The angiographic result was satisfactory and resulted in the almost complete exclusion of the known malformation. Hemostasis of the access site was achieved with the StarClose system and compression bandage.

3 weeks after embolization, surgical resection of the lesion was performed after local anesthesia [Figs 7–8-9–10-11–12].

At histology, the diagnosis of globular capillary hemangioma with the widespread granulomatous reaction of the giant cell type (the result of the previous embolization procedure) was confirmed [Figs 13–14-15].

Two special histological stains of the malformation were performed:

1. a Masson trichrome for the connective tissue: which highlighted the fibrous tissue that buries the lesion (hence the adjective "lobular" which describes the neoformation, and which connotes hemangiomas of pyogenic granuloma type) [Fig 16].
2. a stain for the elastic fibers: it highlights the structure of the vessel wall; most of them are altered by the lively gigantocellular granulomatous reaction linked to embolization, in-depth some have an average caliber, residual fields with smaller vessels such as capillaries [Fig 17].

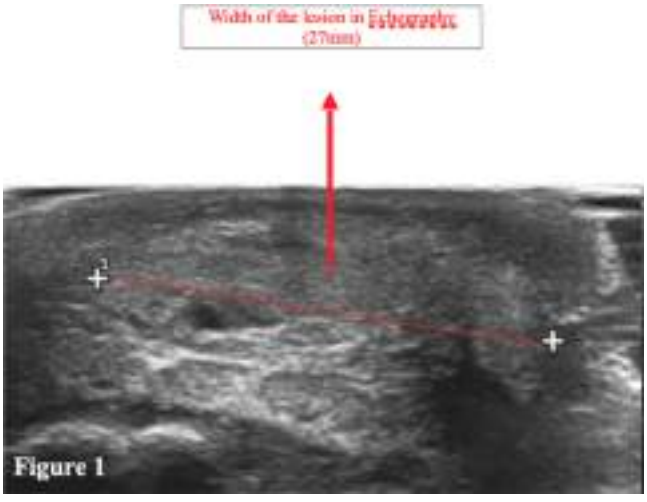


Fig. 1. Width of the lesion in Echography (27 mm).

Fig. 2. Height of the lesion in Echography (15 mm).

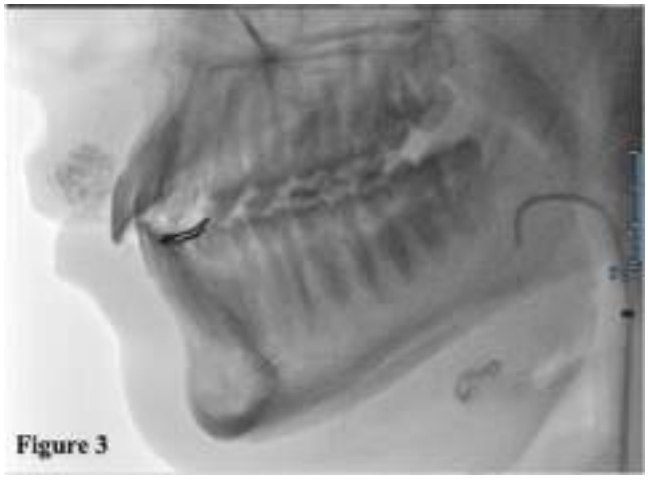


Fig. 3. LCH Embolized.

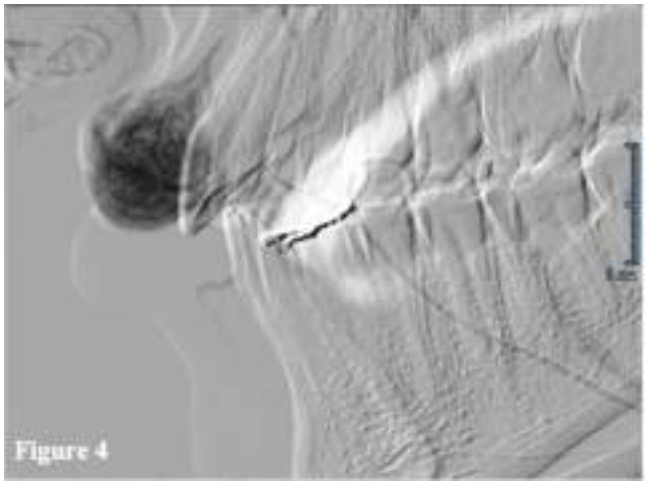


Fig. 4. LCH Embolized.

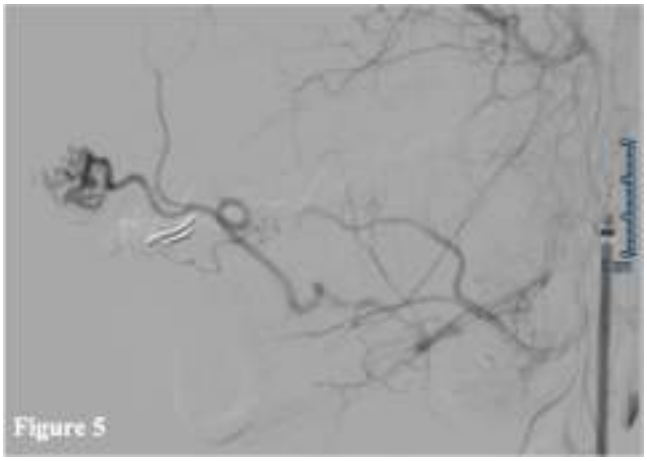


Fig. 5. LCH Embolized.

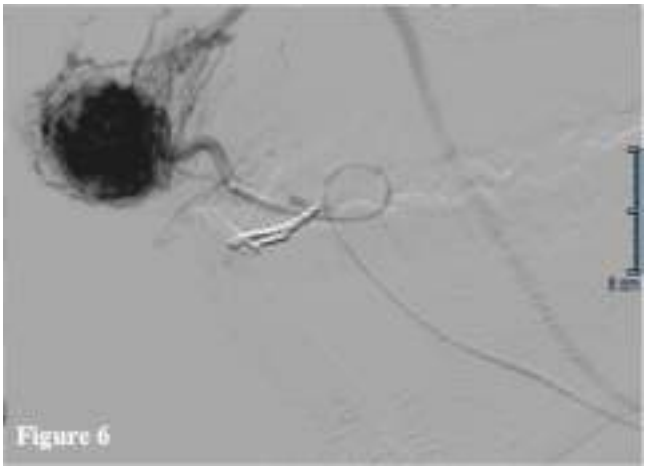


Fig. 6. LCH Embolized.

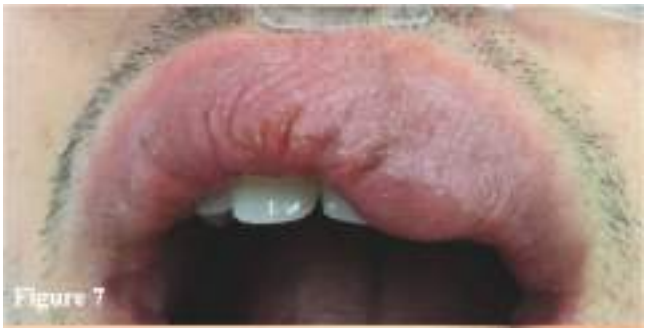


Fig. 7. Preoperative embolized LCH (extraoral vision).

One year after surgery there is no evidence of recurrence or visible scarring [Figs 18–19]

3. Discussion

The most common surgical treatment of lobular capillary hemangioma (LCH) is surgical excision; this involves the complete removal of the lesion through surgery. It is often used for large lesions or those in areas prone to repeated trauma. Excision can be combined with curettage and electrocautery to reduce the risk of recurrence.

The possible alternative treatment approaches for lobular capillary

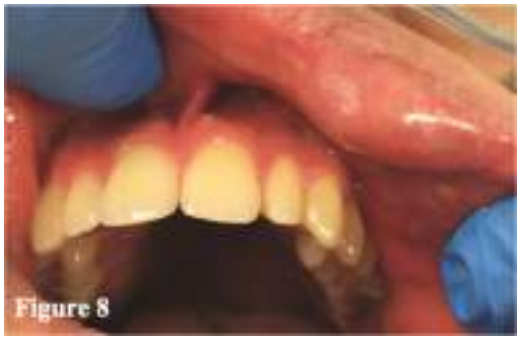


Fig. 8. Preoperative embolized LCH (intraoral vision).

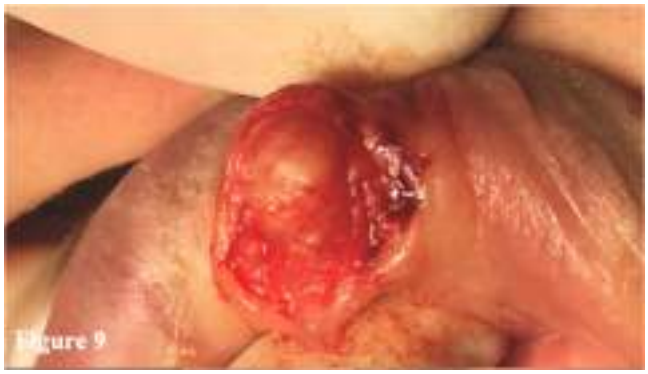


Fig. 9. LCH exposure after incision.

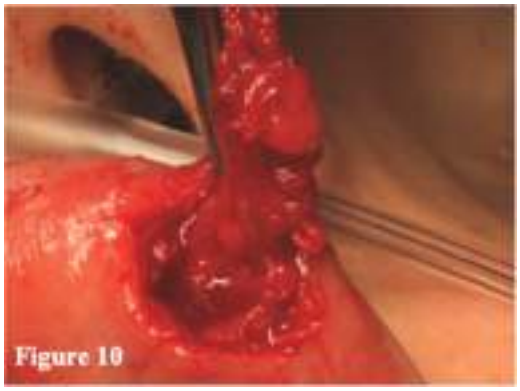


Fig. 10. LCH dissection and excision.

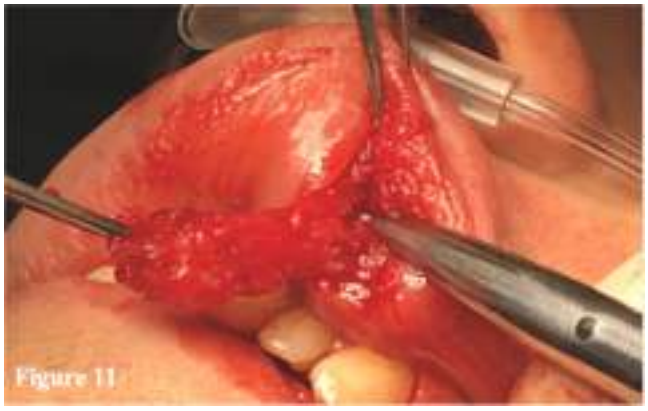


Fig. 11. LCH dissection and excision.

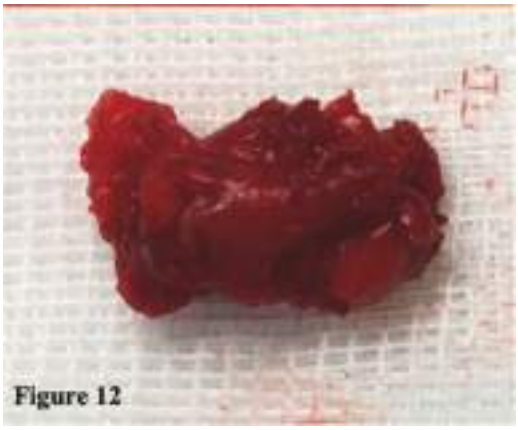


Fig. 12. LCH excised.

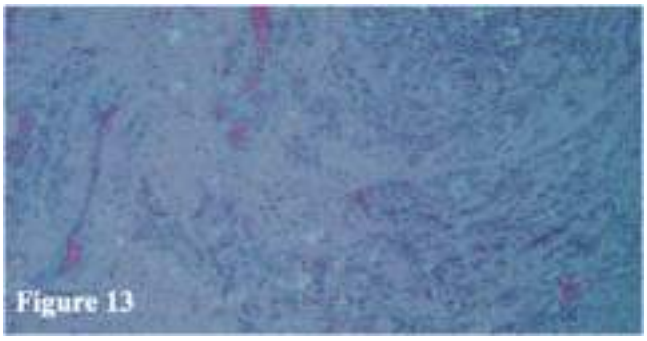


Fig. 13. Field to capillary hemangioma type.

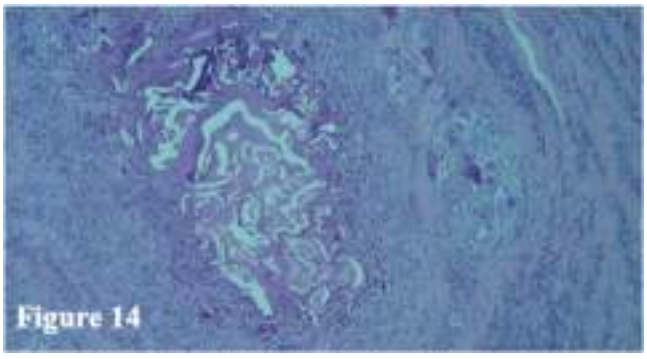


Fig. 14. Giant cell granulomatous reaction from microembolization.

hemangioma proposed by the literature are:

- Curettage and electrocautery: curettage involves scraping the lesion with a specialized instrument, followed by electrocautery to control bleeding and destroy any remaining tissue. This technique is suitable for small lesions and has a low recurrence rate.
- Laser therapy: laser treatment, such as pulsed CO2 laser, the Nd:YAG, flash-lamp pulsed dye laser, is effective for small lesions or those in cosmetically sensitive areas. The laser coagulates the blood vessels within the lesion, reducing bleeding and promoting regression.

The use of the laser has several benefits: ease of soft tissue ablation,

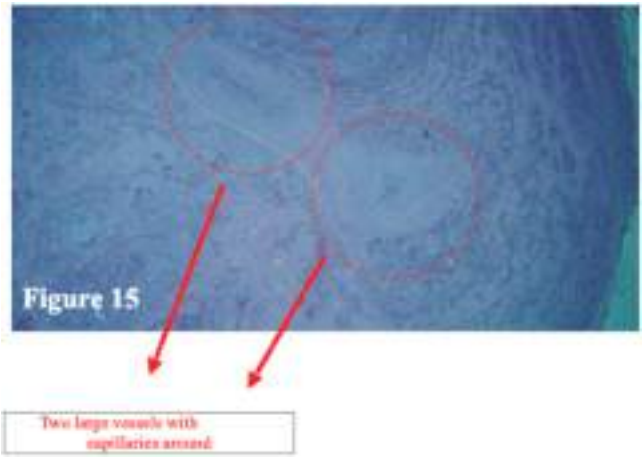


Fig. 15. Two large vessels with capillaries around.

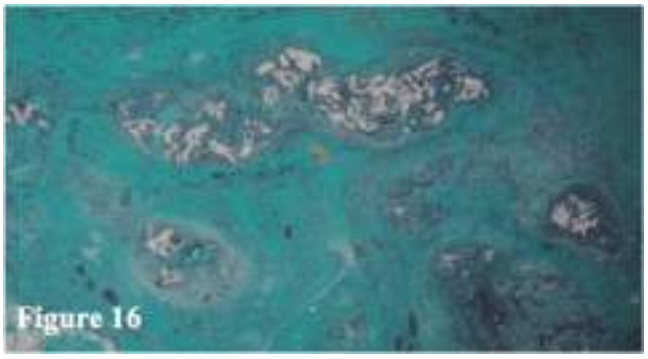


Fig. 16. A Masson trichrome for the connective tissue.

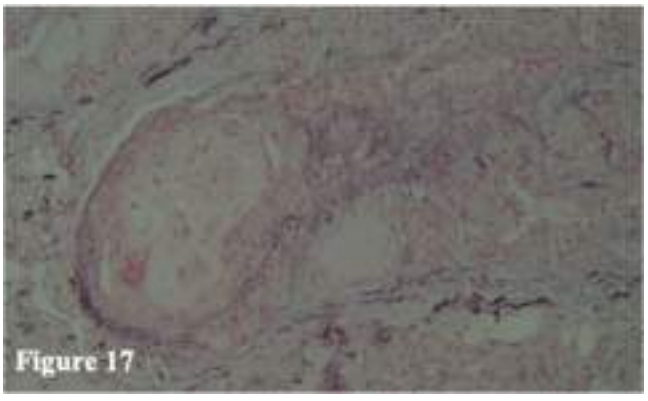


Fig. 17. A few residual elastic fibers (in black) of the wall of a vessel of a certain caliber with giant cell reaction in the lumen.

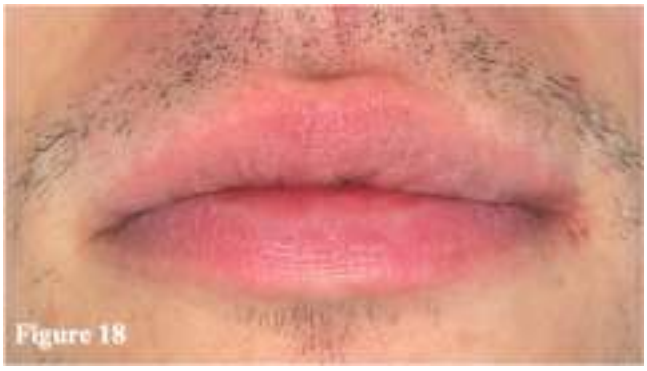


Fig. 18. 1 year after surgery: cutaneous side.

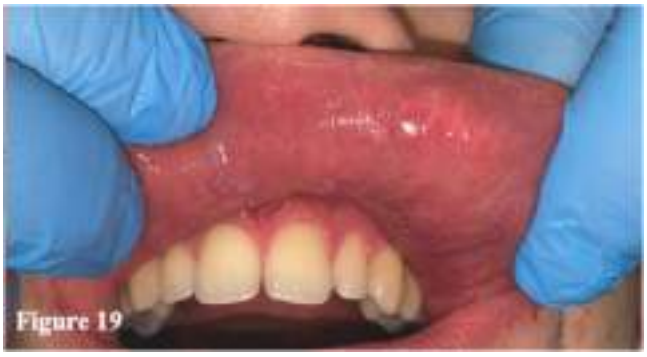


Fig. 19. 1 year after surgery: mucous side.

hemostasis, instant sterilization, reduced bacteremia, small wound contraction, reduced edema, minimal scar, no or few sutures, and greater patient acceptance. [8] The same author, however, reports that the use of the diode laser involves a high proliferative response on the part of fibroblasts and that this activity may be correlated with the eventual recurrence of the lesion observed in his case. The disadvantages, on the other hand, can include scars and deformities, especially in the presence of lesions of considerable size, difficult surgical areas also limit their application. In addition, repeated treatments are usually necessary [12].

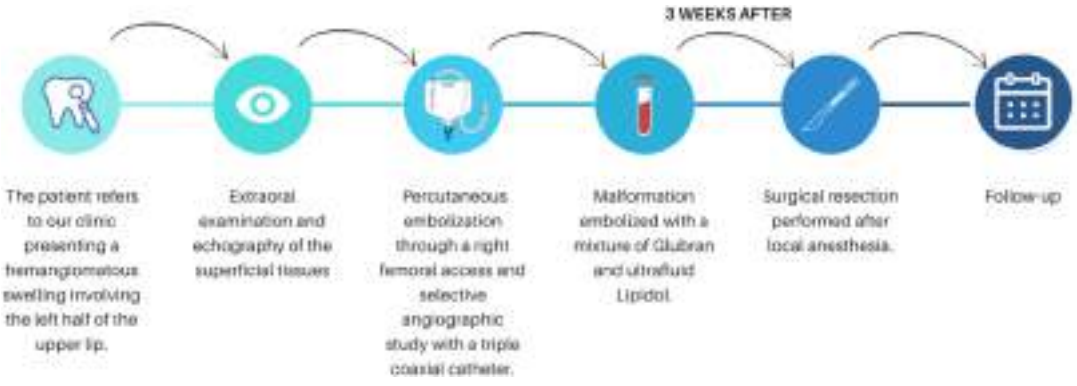
- Topical corticosteroid application: in some cases, the use of potent topical corticosteroids under occlusion can help reduce inflammation and lesion size. However, this approach is less common and usually reserved for specific situations.
- Cryotherapy: the application of liquid nitrogen to freeze the lesion is a method used for small pyogenic granulomas. Cryotherapy destroys the affected tissue, which eventually falls off, allowing the underlying skin to regenerate.
- Sclerotherapy: injecting sclerosing agents into the lesion induces the closure of blood vessels, leading to lesion regression. This method is less common but can be considered in selected cases.
- The choice of treatment depends on various factors, including lesion size and location, patient age and health status, and individual preferences. A thorough clinical evaluation is essential to determine the most appropriate therapeutic approach. [9,11,12]

Embolization aims to restore function and prevent complications related to bleeding [13]. The microembolization used in our case allowed the complete surgical removal of the LCH with minimal blood loss [14]. As also noted by Forman in his case [15].

In the case of large lesions and areas of high aesthetic importance, embolization can be a valid support in the pre-surgical phase. Avoiding excessive bleeding during surgery allows for excellent viability and the removal of the lesion completely, reducing the risk of recurrence. It also reduces the risk of wound bleeding and creating marked deformities.

Microembolization, properly performed, is a valid tool for treating LCH in aesthetic areas and areas at high risk of bleeding. It allows to perform the excision surgery reducing the risks, improving the prognosis, and reducing the risk of recurrence. The recurrence rate of LCH treatment is approximately 16 % due to incomplete lesion removal, the failure to remove the etiological factors, or to re-injury at the site of the lesion [7].

It is, therefore, necessary to evaluate the size, position, and severity of the lesion in the presence of LCH, in order to implement the most suitable treatment.



Ethical approval

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Consent to participate

Not Applicable.

Consent to publish

Not Applicable.

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CRediT authorship contribution statement

Paolo Appendino: Conceptualization, Supervision, Project administration. **Luca Guaschino:** Data curation, Methodology, Writing – original draft. **Marta Bezzi:** Validation, Visualization, Writing – review & editing. **Luciano Mosso:** Investigation, Formal analysis, Resources. **Ernesto Scatà:** Investigation, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Not applicable

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