



Case Report

Mandibular Gingival Pyogenic Granuloma Spreading to Chin Region: a Case Report

Andri Hardianto^{1*}, Wilson Wijaya¹, Winarno Priyanto²

¹Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Padjadjaran University, Bandung, Indonesia

²Department Faculty of Oral and Maxillofacial Surgery, Hasan Sadikin General Hospital, Bandung, Indonesia

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Abstract

Vascular lesions tumors at the maxillo-facial area could be divided into malformations and tumors. Furthermore, vascular tumors are separated into malignant and benign tumors. Benign vascular tumor such as pyogenic granuloma usually only manifests at the gingiva or oral mucosa region. Few studies have reported extensive-sized facial pyogenic granuloma. This case reports a substantial pyogenic granuloma from the mandibular gingiva down to the chin region. In this case report, we presented a 25-year-old female patient with mastication and esthetic disturbance due to a vascular tumor in her mandibular region. Through thorough examination, a benign vascular lesion was diagnosed pre-operatively. The patient was treated with excisional biopsy and primary closure under general anaesthesia followed by anatomical pathology examination with the result of pyogenic granuloma, resulting in satisfying functional and esthetical outcomes. Patients with vascular lesions need well-executed diagnoses and treatment to achieve favourable anatomic and functional outcomes and preserve their quality of life.

Keywords: benign vascular tumor; pyogenic granuloma; vascular lesion; vascular tumor

INTRODUCTION

Vascular lesions represent a wide range of vascular malformations and tumors, often occurring at head and neck regions. These include various vascular malformations and tumors, from simple capillary lesions to complicated lesions on arteries, veins, lymphatics, or a combination of these anatomies. Due to the wide variations of subjective examination, clinical presentation and symptoms, which depend on the lesion, accurate diagnosis is important to determine the best treatment for these lesions.¹

Anomalies of the vascular system are classified into tumors and malformations, according to the International Society for the Study of Vascular Anomalies by Mulliken and Glowacki in 1982 and modified in 2014, as shown in Table 1. This classification divides vascular lesions into two major categories: tumors (neoplasm) and malformations (congenital defects). Vascular tumors are furthermore divided into benign, locally invasive and malignant tumors, while vascular malformations are divided into simple and complex ones.^{2,3}

* Corresponding author, e-mail: andri.hardianto@fkg.unpad.ac.id

Table 1. Classification of Vascular Lesions according to the International Society for the Study of Vascular Anomalies

Hemangiomas	Vascular Malformations
Hemangioma	High-flow
- Infantile	- Arteriovenous
- Congenital (rapidly involuting congenital hemangioma or non-involuting congenital hemangioma)	- Mixed arterial
KHE (kaposiform hemangioendothelioma)	Low-flow
Tufted angioma	- Venous
Pyogenic granuloma	- Lymphatic
Other rare vascular tumors	- Capillary or venular

Another classification of vascular lesions is based on anatomical location of the lesion described by Nair: type I: located superficially requires skin/mucosa excision, sometimes local/regional flap for reconstruction; type II: submucous lesion treated with skin flap and complete excision; type III are venous or lymphatic-venous lesion involving glands located at head and neck region, requires excision of the affected gland; type IV are intraosseous lesion, requiring cortical/medullary excision; type V involves deep visceral spaces such as deep neck space (parapharyngeal, retropharyngeal spaces) that requires osteotomy for surgical access.³⁻⁵

Vascular tumors usually rarely appear. They could be acquired throughout life. These characteristics distinguish vascular tumor from vascular malformations, while vascular malformations emerge from birth and enlarge over time. This attribute helps clinicians to distinguish and diagnose vascular tumors from vascular malformations, thus simplifying determining one lesion of another.^{4,6}

One of the most prominent vascular tumor is Pyogenic granuloma (PG), usually expressed as lobullary capillary hemangioma, first found in 1979. This lesion is a benign, vascular-originated tumor derived from endothelial cells,

histologically described with disorganized capillary proliferation with endothelial markers such as CD 31 and/or CD 34. Its differential diagnosis consists of thrombosis of the vein, papillary endothelial hyperplasia and angiosarcoma.^{1,7,8}

This case report aims to provide scientific information regarding the surgical treatment of facial Pyogenic granuloma (PG).

CASE REPORT

A 25-year-old female patient came with a lump at her anterior lower gum. +/- 18 years ago. The patient complained of mobile lower front teeth, which were extracted. After 6 months following tooth extraction, a painless, reddish, quail egg-sized lump appeared. The biopsy was carried out with the result of a benign lesion, then 5 doses of sclerotic therapy were carried out, and the lump waned. +/- 9 years ago. The patient's chin stumbled hard, and then a lump appeared (since the patient admitted that there was redness on this chin that persisted, but the patient did not seek any treatment. +/- 5 months ago. The patient felt the lump that had significantly enlarged to the size of a chicken egg, causing the patient to be unable to close her mouth, but the patient did not seek any treatment (Figure 1).

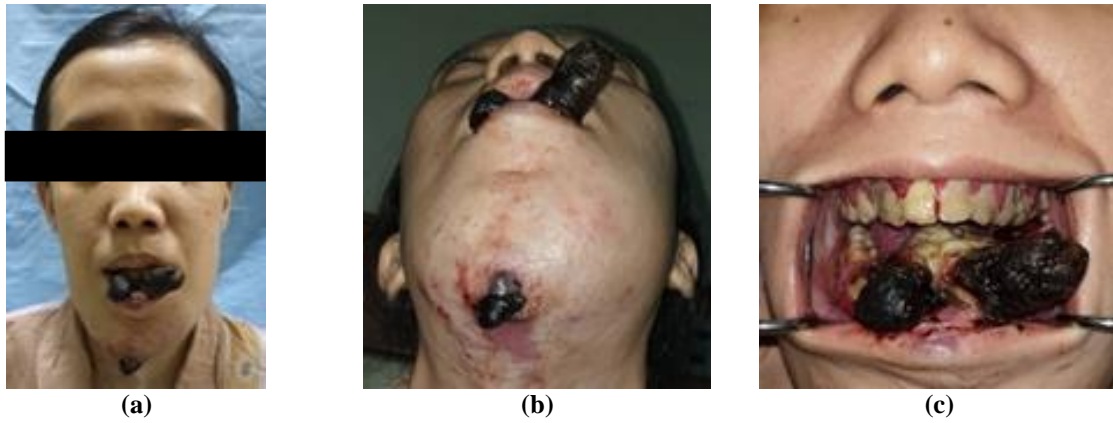


Figure 1. Clinical images of the patient: (a) Pre-operative profile; (b) Pre-operative extra oral; (c) Pre-operative intra-oral

+/- 1 month ago, FNAB (fine needle aspiration biopsy) was carried out with results of non-specific chronic lymphadenitis at the left neck region. CT angiography and panoramic x-ray was carried out as adjuvant examination for establishing a working diagnosis of

vascular tumor, with the conclusion of the hypervascular lesion at the chin region that was fed from the bilateral facial artery, drains to the facial vein and radiodiagnosis of arteriovenous malformation dd/Hemangioma (Figure 2).



Figure 2. Modalities of the patient: (a) Panoramic x-ray; (b) CT angiography

The tumor was excised under general anaesthesia, and the related vascular system was ligated to prevent a recurrence. The excised tumor was examined histologically afterwards, resulting in pyogenic granuloma as its outcome (Figure 3), then,

the patient was hospitalized for 2 days. The patient was instructed for post-operative control at Hasan Sadikin General Hospital Oral and Maxillofacial Surgery outpatient clinic on postoperative day 7.

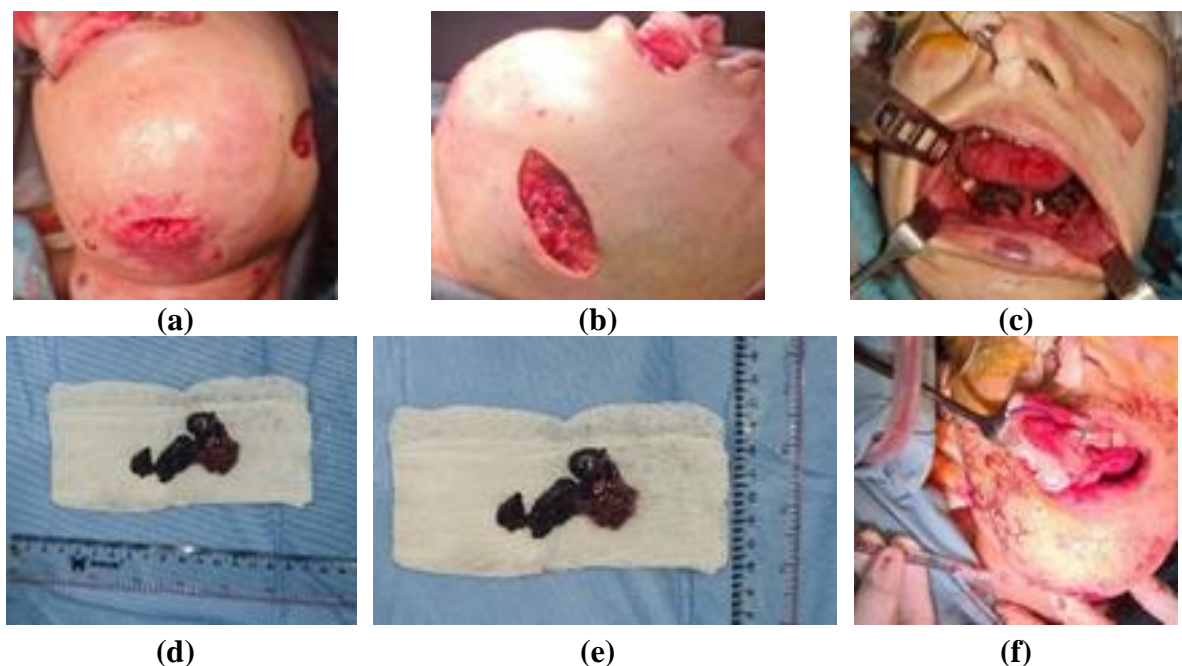


Figure 3. (a, b, c) Excision of the tumor; (d & e) Tumor; (f) Injection of sclerotic agent; (d and e) Excised tumor; (f) Injection of sclerotic agent

DISCUSSION

Vascular anomalies are one of such vast anomalies in the head and neck region, found in soft tissue such as mastication muscle, oral mucosa or skin. Any anatomy does not restrict these anomalies/lesions; thus, they could appear in any anatomy or organ. Vascular anomalies are divided into malformations and tumors. Furthermore, vascular tumors are classified as benign and malignant tumors. Precise history and clinical inspection, followed by adjuvant examination such as anatomical pathology and radiology, could determine the exact diagnosis and treatment.^{2,9,10}

Clinically, head and neck vascular lesions could be located at skin or mucosa such as gingiva, buccal, lip, palate, etc and described as reddish, purplish or bluish, bulging, palpable lesions. Vascular tumors used to be called “port-stain wine”, “cavernosum”, etc., until in 1996, vascular lesions were classified by the International Society for the Study of Vascular Anomalies (ISSVA), dividing vascular lesions into vascular malformations and hemangiomas as in Figure 1. Vascular malformations were further classified by: (1) type of involved vessels, single form

(arterial, venous, capillary or lymphatic) and combination of these vessels; (2) depth of the lesion; and (3) characteristics of the flow of the lesion by Nair on 2014.^{2,3,11}

Pyogenic granuloma (PG) or lobular capillary hemangioma is a vascular tumor that usually occurs spontaneously or following trauma. Often seen at the gingiva, these tumours assume that pyogenic granuloma is caused by calculus or foreign bodies along the gingival sulcus, frequently induced by trauma. Clinically, PGs are red, pedunculated masses that bleed spontaneously or with stimulus.¹²⁻¹⁴

Histologically, PG was described as a highly vascularized proliferation of granulation tissue. It often demonstrates surface ulceration and a subacute inflammatory cell infiltrate comprised of neutrophils, lymphocytes and plasma cells and may demonstrate a lobular arrangement of capillary vessels and proliferating endothelial cells delineated by fibrous septae (termed lobular capillary hemangioma). It may be pedunculated and show a brisk mitotic rate (up to 10 mitotic figures per high power field); however, it lacks pleomorphism, as we can see in Figure 4.¹⁵⁻¹⁷

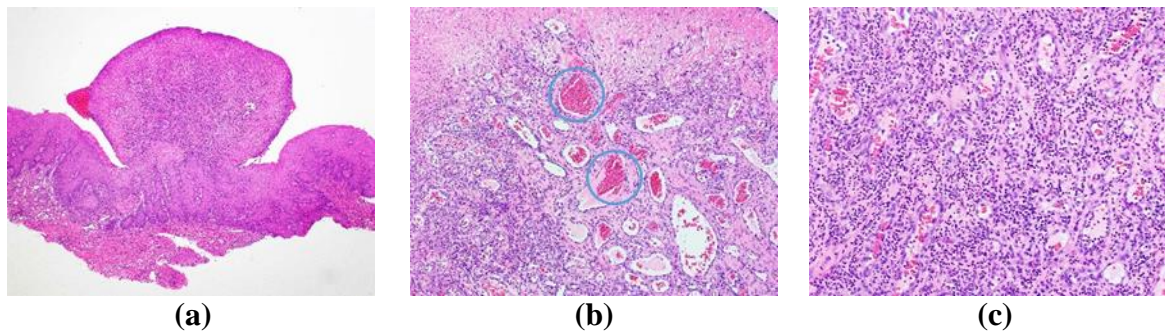


Figure 4. Histology of pyogenic granuloma: (a) Pedunculated mass of pyogenic granuloma; (b) Prominent vascular complex; (c) Substantial amount of inflammation cells.

Other than clinical and histological, a diagnosis of PG could be established with the help of radiological imaging using conventional X-rays, CT scans, and MRI. PG is described radiologically as homogenous hyperintense, hyperechoic lesions with sumptuous peripheral feeding vessels around the lesion. In addition to locating the site and margins of the lesion, these modalities could further inform us regarding related vascular complex, helping clinicians determine whether treatment is needed for the draining blood vessel.^{14,18–20}

The patient was diagnosed clinically (vascular tumor at gingiva until chin region, bleeds easily following trauma +/- 9 years ago), followed by FNAB with result non-specific chronic lymphadenitis at the left neck region of with excision of the tumor, ligation of the left facial artery to prevent a recurrence. The excised tumor was examined histologically, with the result of Pyogenic granuloma. The patient was hospitalized for 2 days post-operatively and discharged with no significant complaint.

CONCLUSION

It is important to remember that vascular anomalies of the head and neck can be divided into vascular tumors and vascular malformations; the former representing true proliferative neoplasms and the latter defects of vascular morphogenesis. These lesions, such as Pyogenic Granuloma, can be present in various locations in the head and neck. Imaging plays a role in many of these lesions. Knowledge of the classification of these lesions based on the updated 2018

International Society for the Study of Vascular Anomalies and characteristic imaging findings are key to diagnosis and subsequent appropriate treatment.

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REFERENCE

1. Hoff SR, Rastatter JC, Richter GT. Head and Neck Vascular Lesions. *Otolaryngologic Clinics of North America* [Internet]. 2015 Feb;48(1):29–45. Available from: <http://dx.doi.org/10.1016/j.otc.2014.09.004>
2. Wassef M, Blei F, Adams D, Alomari A, Baselga E, Berenstein A, et al. Vascular Anomalies Classification: Recommendations From the International Society for the Study of Vascular Anomalies. *Pediatrics* [Internet]. 2015 Jul 1;136(1):e203–14. Available from: <http://dx.doi.org/10.1542/peds.2014-3673>
3. Nair SC. Vascular Anomalies of the Head and Neck Region. *Journal of Maxillofacial and Oral Surgery* [Internet]. 2018 Jan 5;17(1):1–12. Available from: <http://dx.doi.org/10.1007/s12663-017-1063-2>
4. Brahmabhatt AN, Skalski KA, Bhatt AA. Vascular lesions of the head and neck: an update on classification and imaging review. *Insights into Imaging*

- [Internet]. 2020 Feb 7;11(1). Available from: <http://dx.doi.org/10.1186/s13244-019-0818-3>
5. Rana R, Ramachandra SS, Prasad UC, et al. Recurrent pyogenic granuloma with a satellite lesion. *Cutis* 2015; 96: E27-30.
 6. Kumar S, Kumar V, Kumar S, Kumar S. Management strategy for facial venous malformations. *National Journal of Maxillofacial Surgery* [Internet]. 2014;5(1):93. Available from: <http://dx.doi.org/10.4103/0975-5950.140188>
 7. Cooper PH, McAllister HA, Helwig EB. Intravenous pyogenic granuloma. *The American Journal of Surgical Pathology* [Internet]. 1979 Jun;3(3):221–8. Available from: <http://dx.doi.org/10.1097/00000478-197906000-00004>
 8. Blaya E, Vento V, Kuntz S, Bruyns L, Ohana M, Weingertner N, et al. Intravenous Lobular Capillary Haemangioma (Pyogenic Granuloma) of the Superior Vena Cava: Case Report and Literature Review. *EJVES Vascular Forum* [Internet]. 2021;50:32–6. Available from: <http://dx.doi.org/10.1016/j.ejvsf.2020.12.021>
 9. Fowell C, Verea Linares C, Jones R, Nishikawa H, Monaghan A. Venous malformations of the head and neck: current concepts in management. *British Journal of Oral and Maxillofacial Surgery* [Internet]. 2017 Jan;55(1):3–9. Available from: <http://dx.doi.org/10.1016/j.bjoms.2016.10.023>
 10. Colletti G, Frigerio A, Giovanditto F, Biglioli F, Chiapasco M, Grimmer JF. Surgical Treatment of Vascular Malformations of the Facial Bones. *Journal of Oral and Maxillofacial Surgery* [Internet]. 2014 Jul;72(7):1326.e1-1326.e18. Available from: <http://dx.doi.org/10.1016/j.joms.2014.02.012>
 11. Alsuwailam A, Myer CM, Chaudry G. Vascular anomalies of the head and neck. *Seminars in Pediatric Surgery* [Internet]. 2020 Oct;29(5):150968. Available from: <http://dx.doi.org/10.1016/j.sempedsurg.2020.150968>
 12. Syed N. Vascular lesions of head and neck: A literature review. *Indian Journal of Dental Sciences* [Internet]. 2016;8(3):176. Available from: <http://dx.doi.org/10.4103/0976-4003.191726>
 13. Ghalayani P, Hajisadeghi S, Babadi F. Extralingival pyogenic granuloma associated with medication: Report of an unusual case. *Dent Res J (Isfahan)* 2014; 11: 400–404.
 14. Guneyli S, Ceylan N, Bayraktaroglu S, Acar T, Savas R. Imaging findings of vascular lesions in the head and neck. *Diagnostic and Interventional Radiology* [Internet]. 2014 Aug 26;20(5):432–7. Available from: <http://dx.doi.org/10.5152/dir.2014.14004>
 15. Rastogi K, Singh L, Khan NA, Goyal S, Khatri A, Gupta N. Benign vascular anomalies: A transition from morphological to etiological classification. *Annals of Diagnostic Pathology* [Internet]. 2020 Jun;46:151506. Available from: <http://dx.doi.org/10.1016/j.anndiagpath.2020.151506>
 16. Miller DD, Gupta A. Histopathology of vascular anomalies: update based on the revised 2014 ISSVA classification. *Seminars in Cutaneous Medicine and Surgery* [Internet]. 2016 Sep;35(3):137–46. Available from: <http://dx.doi.org/10.12788/j.sder.2016.053>
 17. Sachdeva SK. Extralingival Pyogenic Granuloma: an Unusual Clinical Presentation. *J Dent (Shiraz)* 2015; 16: 282–285.
 18. Shetty AK, Wadkar P. Multiple Pyogenic Granulomas: A Case Report. *Advances in Human Biology* 2015; 5: 60.

19. Wollina U, Langner D, França K, Gianfaldoni S, Lotti T, Tchernev G. Pyogenic Granuloma – A Common Benign Vascular Tumor with Variable Clinical Presentation: New Findings and Treatment Options. Open Access Macedonian Journal of Medical Sciences [Internet]. 2017 Jul 19;5(4):423–6. Available from: <http://dx.doi.org/10.3889/oamjms.2017.111>
20. Park H, Kim JS, Park H, Kim JY, Huh S, Lee JM, et al. Venous malformations of the head and neck: A retrospective review of 82 cases. Archives of Plastic Surgery [Internet]. 2019 Jan;46(01):23–33. Available from: <http://dx.doi.org/10.5999/aps.2018.00458>