Microvascular flap reconstruction of pharynx in patient with actinomycosis

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Abstract  
Surgical treatment for patients with actinomycosis with head and neck reconstruction should be considered as a reliable treatment option with a good long-term effect.

Keywords  
actinomycosis, head and neck surgery, microvascular flap, pseudotumor, reconstructive surgery, tonsils

1 INTRODUCTION

Actinomycosis is an endogenous, granulomatous, and suppurative infection which is caused by an anaerobic, filamentous gram-positive bacteria Actinomyces sp.1,2 It is a rare disease, mostly seen in the cervicofacial area.

As actinomyces are members of the commensal oral flora, spontaneous pathogenicity is low but factors such as dental treatment, maxillofacial trauma, poor dental hygiene promote the development of disease. The pathogenesis is not known.2

Microbiological studies on tonsils after tonsillectomies have shown that actinomyces colonize tonsillar crypts in 6.7%-35% of samples.1,3

The disease is characterized by the formation of slightly painful pseudotumor of slow growth, which may progress into abscess and form fistulous tracts. Diseases associated with actinomycosis may also resemble malignancies, tuberculosis, and nocardiosis, often leading to misdiagnosis.2,3

Usually, actinomycosis is ongoing with no associated adenopathy.2

Penicillin at high doses for several weeks or even months (depending on the characteristics of the disease) is the gold standard of treatment. Surgery is indicated in case of fistula, encysted pseudotumoral forms (uncontrolled with medical treatment), bone sequesters, or for a removal of necrotic tissue.1

This report reviews a unique case where excision of the lesion was combined with the soft tissue reconstruction using microvascular fasciocutaneous anterolateral thigh flap (ALT). Reconstruction of peritonsillar region in case of actinomycosis has not been mentioned in the literature before.

2 CASE REPORT

A 68-year-old male with type II Diabetes (noninsulin-dependent) came to the hospital on 09.10.2018 with a 2 weeks history of pain in the left side of the neck, especially when swallowing, and permanent subfebrile temperature. Usage of NSAIDs showed no effect.

Ear-nose-throat (ENT) examination revealed massive soft tissue destruction on the left side of peritonsillar region and tonsillar niche without signs of bleeding.

Computed tomography scan with intravenous contrast detected an extensive lesion in the area of the left peritonsillar and pharyngeal region with the liquified central part of it. Differential diagnosis included abscess and tumor. Magnetic
resonance imaging (MRI) revealed a lesion on the left submandibular region, laterally to major neck vessels with compression of internal jugular vein (Figure 1).

Lesion was located posterior from submandibular salivary gland, dislocating it to the front. MRI also showed defect in the soft tissues on the left side of oropharynx, heterogenous thickening of palatine tonsil tissues and necrotic lymph node next to the internal jugular vein.

Biopsy was taken 2 times to exclude malignancy. Bacteriologic testing proved actinomycosis.

Patient was treated with Benzylpenicillin intravenously, 18 million units per 24 hours and painkillers. He was hospitalized for 1.5 months in specialized Infectiology center. After discharge to home care, the therapy was changed to Amoxicillin 500 mg perorally 3 times per day, for half a year. He developed recurrent severe bleeding episodes which required emergency care and blood transfusion.

On 29.04.2019, patient was hospitalized for an elective surgery. He still had pain in the throat and dysphagia.

Surgery included superior tracheostomy, left side submandibular salivary gland resection, selective lymphadenectomy, mandibulotomy, resection of destructive tissue, defect reconstruction with microvascular ALT flap, reosteosynthesis of mandibula with mini-plates.

Surgery was done by two teams. To reach the oropharyngeal tissues properly, osteotomy of mandibula was performed. It was followed by left submandibular salivary gland and unilateral neck dissection, with removal of lymphatic tissue from regions Ib, II, III. Surgical team established a big collapsing lymph node, fixed over carotid artery, and internal jugular vein. With accurate mobilization, it was possible to divide it from the magistral blood vessels and nerves while keeping them intact. After maximal resection of the lymph node and going deeper to the wall of destructive tissues in the throat, debridement was performed on the lateral wall beyond the excision margins into a healthy tissue (Figure 2). Surgical specimen was sent to histology testing.

The big defect in the posterior-lateral wall of the pharynx had to be closed with the flap to preserve normal functions. Reconstruction was made with the ALT flap, which has a blood supply from descending branch of lateral circumflex femoral artery (Figure 3). ALT fascia was sutured as additional layer to improve stability of pharyngeal wall and palates.

Reosteosynthesis of mandibula was made using 2-0 mini-plates. Superior thyroid artery's branch, external jugular vein, and internal jugular vein's side branches were dissected. Under the microscope, end-to-end anastomosis was made between artery and superior thyroid artery and end-to-end anastomosis from accompanying vein to neck veins.

Patient was transferred to the intensive care unit for 1 day, after showing improvement in general condition, surgical care was performed in the ward.

Postoperative period did not show any complications, flap had a good perfusion. Patient underwent rehabilitation under supervision of logopaedics. He was discharged on 12th postoperative day, without breathing and swallowing difficulties.

Check-ups after 3, 6, 9, and 12 months showed a good healing of the flap, no odynophagia, and dysphagia (Figure 4). Patient showed no recurrence in 1 year and is currently asymptomatic and still using antibacterial therapy with Amoxicillin/Clavulanic acid 1 g perorally twice a day.

3 | DISCUSSION

In most of the cases, treatment of actinomycosis is limited to antibiotics. Surgical treatment, when indicated, involves

**FIGURE 1** Magnetic resonance imaging scan—massive infiltrative mass of left peritonsillar and pharyngeal region

**FIGURE 2** During surgery—mandibulotomy and after destructive tissue destruction
incision, drainage, debridement, and curettage of bone as necessary. In the literature reconstructive head and neck surgery is mentioned only in cases of facial, dermal, bone, or sinus involved actinomycosis.4,5

In our case, lesion was expanding despite long-term antibiotic treatment. The lesion was located proximal to major neck vessels, which without surgical intervention could cause severe, even fatal hemorrhage. Debridement without reconstruction would lead to permanent dysphagia.

Reconstruction with the anterolateral thigh fasciocutaneous flap is widely used in case of tonsillar tumor with good healing effect. Healing and rehabilitation went as planned despite patient's diabetes mellitus. Patient is satisfied about the functional and esthetical result of the surgery.

Friedman et al in 1996 reported a case with a patient who developed actinomycosis after treatment for left tonsillar squamous cell carcinoma (T2, N1, M0), treated with chemotherapy and radiotherapy. The reconstruction was made with a microanastomosed fasciocutaneous forearm flap. After surgery, severe trismus and dehiscence of the flap were observed. Seven weeks postsurgery, massive endobuccal hemorrhage originated that could not be properly controlled due to the trismus, resulting in death despite resuscitation attempts. Postmortem computed tomography showed spontaneous rupture of the left carotid artery located at the carotid bifurcation.6

Kummer et al in 2012 reported a case with a patient who developed actinomycosis after treatment for left tonsillar squamous cell carcinoma (T2, N1, M0), treated with chemotherapy and radiotherapy. The reconstruction was made with a microanastomosed fasciocutaneous forearm flap. After surgery, severe trismus and dehiscence of the flap were observed. Seven weeks postsurgery, massive endobuccal hemorrhage originated that could not be properly controlled due to the trismus, resulting in death despite resuscitation attempts. Postmortem computed tomography showed spontaneous rupture of the left carotid artery located at the carotid bifurcation.7

Both of the reported patients had previously suffered from oropharyngeal carcinoma and underwent radiation therapy which might be the contributing factor to the carotid artery rupture.

4 | CONCLUSIONS

Cervical actinomycosis resistant to long-term antibiotic therapy might lead to life-threatening and quality-of-life degrading complications. We present a case with a good long-term surgical result and by that we suggest that surgical treatment with reconstruction should be considered as a reliable treatment option.

ACKNOWLEDGMENT

We thank the patient for consent to publish this case study.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

AUTHOR CONTRIBUTIONS

AA, JZ, KP, and AI: examined and operated the patient, and collected the data. AA: wrote the initial draft of the manuscript. JZ: reviewed the manuscript. AA, JZ, KP, and AI: edited the draft and reshaped it into this manuscript. All authors approved the final versional of the manuscript and agree to be accountable for all aspects of the work.

ETHICAL APPROVAL

The case report study has been approved by The Research Ethics Committee of Rīga Stradiņš University on 24 September 2020.

INFORMED CONSENT

The authors declare that informed consent was obtained from the patient for the use of any identifiable patient information included in the submission. Such information includes any information that can identify the patient, even by the patient himself. This includes, but is not limited to, patient
description, description of disease course, and accompanying media. As part of this consent, the patient understood and agreed to allow publishing of his information in print and online. This declaration extends to all pictures, figures being submitted for a publication. If any breach of consent and/or violation or medical-legal practices are committed, we take full responsibility for the fault.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author, AA. The data are not publicly available due to restrictions containing information that could compromise the privacy of the research participant and according to the hospitals’ policy.

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