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Case Report

Persistent collection of antibiotic ointment masquerading as a lipoma arising at a surgical site

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ABSTRACT

Antibiotic ointments are often used to treat or prevent infections in surgical wounds. However, due to a dearth of reports on adverse effects, the complications of the use of such ointments, especially possible long-term effects, are largely unknown. We experienced a unique case of a cystic lesion that developed after surgical site infection treated with gentamicin ointment in a 62-year-old man who underwent subtotal glossectomy for tongue cancer. The antibiotic ointment that was applied following abscess drainage remained there, replacing the abscess cavity and forming an oval mass. The lesion was found incidentally on follow-up MR examination to monitor cancer recurrence. On both T1- and T2-weighted images, it showed high-intensity reflecting oily base material, constituting the ointment, which appeared to be a fat-containing tumor such as a lipoma that had arisen at the surgical site. Echo-guided drainage extracted the ointment, which was seemingly unaltered from the time it was applied 11 months before. We describe the clinical course and imaging findings to acknowledge this potential adverse effect associated with topical antibiotic treatment for surgical site infection.

Introduction

Antibiotic ointments are commonly used to treat superficial skin infections. Not only for the epidermis, however, they are also used in deep, subcutaneous tissue to treat or prevent infections arising from ulcers [1], decubitus [2], burns [3], and surgical wounds [4]. It is also known that antibiotic ointment may play a role in accelerating wound healing [5,6]. General adverse effects may include allergic contact dermatitis [7,8] and anaphylaxis [9]; however it remains unknown what kinds of complications can arise, particularly when such ointments are applied to deep tissue.

Abbreviations: CT, Computed tomography; MRI, Magnetic resonance imaging; POD, Postoperative day.

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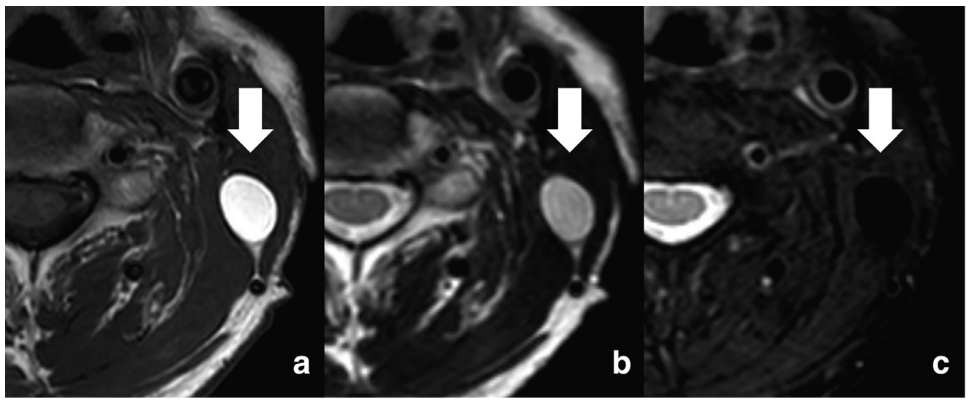

Fig. 1 – MRI of the left neck lesion (arrow). (a, b) T2-weighted images and T1-weighted images show a well-defined and homogenously hyperintense ovoid lesion. (c) Uniform signal suppression on fat saturated T2-weighted images is demonstrated.

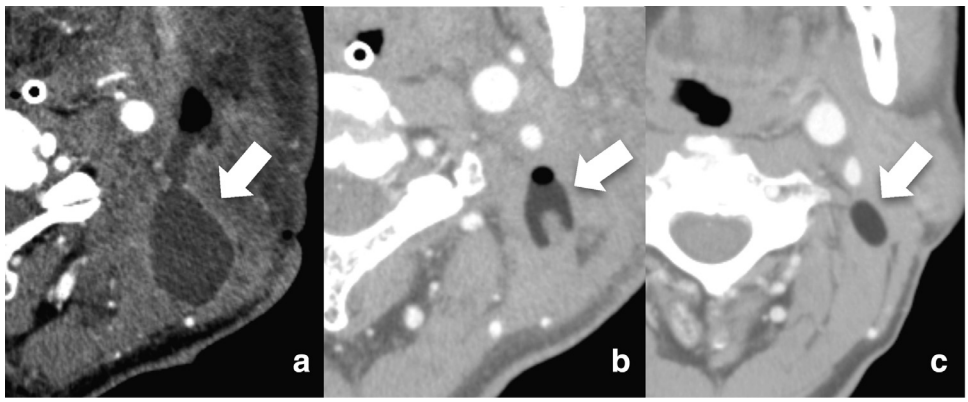

Fig. 2 – Contrast-enhanced CT of the left neck lesion (arrow). (a) CT performed on POD 8 shows fluid collection (average 17 HU) with peripheral enhancement, suggesting an abscess along the drainage tube between the sternocleidomastoid muscle and the levator scapulae muscle. (b) CT performed on POD 23 shows that the lesion was replaced with a fat-density collection (average −147 HU) with an air bubble (average −920 HU). (c) CT performed 7 months later shows that the lesion has become 1 size smaller (average −161 HU). The air bubble has disappeared.

Here, we present a unique case of a cystic lesion that developed after a surgical site infection treated with gentamicin ointment following abscess drainage. The residual ointment replacing the abscess cavity formed an oval mass masquerading as a lipoma. We describe the clinical course and imaging findings to acknowledge this potential adverse effect associated with topical antibiotic treatment for surgical site infection.

Case report

A 62-year-old man who underwent subtotal glossectomy for his tongue cancer 11 months before had a follow-up MRI examination. The MR images demonstrated a well-circumscribed 14-mm oval lesion in the left neck surgical site that was located between the sternocleidomastoid muscle and the levator scapulae muscle (Fig. 1). The lesion showed homogeneous hyperintensity on T2-weighted images (Fig. 1a) as well as on T1-weighted images (Fig. 1b), with uniform signal suppression on fat-saturated T2-weighted images (Fig. 1c). At first glance, the lesion appeared to be a fat-containing tumor such as a lipoma or a well-differentiated liposarcoma. Close review of the patient's medical history revealed that the cystic lesion emerged after an operation to replace a left neck pyogenic abscess. CT taken on postoperative day (POD) 8 demonstrated a well-defined fluid collection measuring 17 Hounsfield units (HU) on average, with a peripheral enhancement along the drainage tube, suggesting an abscess formation (Fig. 2a). Following abscess drainage, gentamicin 0.1% ointment was applied to the surgical site, in addition to the systemic intravenous administration of antibiotics. A follow-up CT performed on POD 23 revealed that the abscess was closed and replaced by a fat-density collection (average −147 HU) with an air bubble (average −920 HU) (Fig. 2b). The lesion became 1 size smaller and the air bubble disappeared 7 months later (Fig. 2c). Based on the clinical course as well

as on the imaging findings, persistent collection of the ointment was suspected.

On physical examination, the lesion was palpable in the patient's left neck. Echo-guided drainage extracted the ointment, which was seemingly unaltered since its application 11 months before. Although not all the ointment was drained, it was decided that the patient be scheduled for observation, considering the risk of infection and the patient's own wishes. The patient has experienced no complications secondary to the antibiotic collection till date (2 years after the MRI).

Discussion

Many antibiotic ointments, including gentamicin ointment, use Vaseline and paraffin as their base materials. Vaseline and paraffin are both mixtures of hydrocarbon derived from petroleum. They are impervious to water, not readily absorbed, and tend to stay on and cover the surface of the skin. These properties allow them to drive the medication into tissue more efficiently than a solution or cream base. In the present case, gentamicin ointment was applied to the abscess cavity following drainage, which permitted adequate contact between the gentamicin and any bacteria in the abscess.

On the other hand, in the field of plastic surgery, Vaseline and paraffin have a long history of being used as fillers to repair a defect in the human body. The technique involves injection of a solid substance that becomes semiliquid when heated. After injection, the filler solidifies as it gets colder, and then remains stable and inert. Vaseline was first used to correct the absence of a testicle in a patient who underwent a castration for tuberculous epididymis 120 years ago [10,11]. Paraffin was subsequently used as an alternative to Vaseline because of its lower melting point, making it soften more easily after the injection [10]. An ointment base classically contains 80% of such oily substances, with the rest being water. Therefore, it is not difficult to imagine that antibiotic ointments, once they have infiltrated and become embedded in the deep part of the body, have the potential to remain there for a long period of time, just as fillers would do. Since Vaseline and paraffin show fat density on CT and fat intensity on MRI [12,13], they could easily mimic a fat-containing tumor that has emerged from the wound.

Although consensus has yet to be reached on the practice, antibiotic ointments are often used for prophylaxis or for the treatment of infections in surgical wounds. Injection of an antibiotic ointment into the deep tissue at a cranioplasty site is also reported to be effective in controlling infections [14]. However, due to few reports on the potential complications of such ointments, their long-term adverse effects are largely unknown. Nevertheless, given the known complications associated with Vaseline and paraffin fillers, perhaps it is important to carefully consider the possibility of adverse effects secondary to the residual ointment. Indeed, the initial results of use of Vaseline and paraffin fillers were satisfying and prompted widespread enthusiasm for the treatment. However, in later years, it became clear that they led to serious long-term complications, including reversible and irreversible skin hardening, swelling, granuloma, and abscess formation, and the fillers can no longer be used legally [11,15–20]. These complications are known to have lag times from weeks to years after administration [11]. Therefore, in the present case, follow-up observation has been scheduled to monitor these potential risks.

In conclusion, penetration or infiltration of antibiotic ointments into the deep part of the body could form a mass lesion that remains there for a long period of time, masquerading as a fat-containing tumor. Although to our knowledge this is the first report of such an event, similar lesions may arise in any part of the body if antibiotic ointment is isolated deep in the wound. Imaging interpretation is not difficult if one is aware of the possibility that they may arise. Correct diagnosis is important to avoid further unnecessary examinations and to adequately manage the potential risks of complications.

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