Thoracic necrotizing fasciitis due to snake ointment that progressed to a mediastinitis

Walid L. Dajer-Fadel* and Carlos Ibarra-Perez and Rafael Borrego-Borrego and Octavio Flores-Calderon

Department of Cardiothoracic Surgery, General Hospital of Mexico, Mexico City, Mexico

* Corresponding author. Tel: +52-55-41920582; fax: +52-55-52562674; e-mail: wadafa@hotmail.com (W.L. Dajer-Fadel).

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Abstract

We report the case of a 42-year old diabetic male presenting with erythema of the neck and anterior right thoracic region secondary to the application of an ointment derived from rattlesnakes, progressing to a full-blown necrotizing fasciitis in a short period of time, with associated mediastinitis, thrombocytopaenia and sepsis. The patient died despite aggressive multidisciplinary medical and surgical treatment. We present this case due to the unusual aetiology and fulminating course.

Keywords: Necrotizing mediastinitis • Necrotizing fasciitis • Rattlesnake ointment

INTRODUCTION

Necrotizing fasciitis is an infection that initially usually affects the skin and then extends to other soft tissues; it must be treated without delay or it may progress to full-blown sepsis; it is frequently caused by the flesh-eating bacteria beta-haemolyticus streptococcus [1]. Treatment consists of the immediate administration of broad spectrum intravenous antibiotics and tissue debridement; otherwise there is an imminent risk of death [2].

We present a case in point where a thoracic wall infection progressed even further, developing into a mediastinal infection. This report is prompted by the rarity of its aetiology, complicating circumstances and fulminating course, as we did not find a similar case in the literature.

CASE REPORT

A 42-year old male with a past history of type 2 diabetes mellitus was admitted to the emergency room (ER) with erythema and oedema involving the right infra-auricular area, ipsilateral shoulder, pectoral and supraescapular regions developing 3 days after the topical application of an ointment derived from rattlesnakes, used as a folk remedy for tensional pain. Upon admission, a bluish skin colour and inflammatory signs were seen (Fig. 1A), with severe movement limitation of the right shoulder; his initial laboratory results of significance showed $5000 \mu\text{l}/\text{mm}^3$ leucocytes ($4480 \mu\text{l}/\text{mm}^3$ neutrophils), $171\,000 \mu\text{l}/\text{mm}^3$ platelets, 3.9 mg/dl of creatinine and 89.9 mg/dl of urea. He was immediately evaluated by the infectology, dermatology, cardiothoracic surgery and ear, mouth and throat services; intravenous imipenem and vancomycin were started. Vesicles appeared in the affected areas 24 h after admission and some of them ruptured. The patient was transferred to the intensive care unit (ICU)

where he presented elevation in the level of leucocytes to $10\,600 \mu\text{l}/\text{mm}^3$ with $7\,700 \mu\text{l}/\text{mm}^3$ neutrophils and skin necrosis was observed 48 h after admission (Fig. 1B). A thoracic computed tomography scan revealed thickened right-sided subcutaneous adipose tissue, bilateral pleural effusions, and enlarged middle and anterior mediastinal compartments (Fig. 2A). The patient was taken to surgery where the cardiothoracic and ear, nose and throat teams performed a right posterolateral thoracotomy, draining 300 ml of purulent fluid from each pleural cavity, primary repair and muscular flap of a necrotic posterior wall of the distal third of the oesophagus, debridement of severely devitalized mediastinal tissue, copious lavage of both thoracic cavities, necrosectomy of all affected soft thoracic wall tissues (Fig. 2B), tracheotomy and cervical exploration that yielded copious purulent discharge; the cervical wounds were left open for daily lavage and debridement in the ICU. During the next 24 h, the patient presented progressive elevation of the leucocyte count to $34\,800 \mu\text{l}/\text{mm}^3$, $77\,000$ platelets, deteriorating renal and hepatic functions and multisystemic failure, conditions that eventually culminated in his demise 4 days after his arrival to the ER. Bacterial cultures taken from different thoracic wall soft tissues and pleural fluid were negative.

DISCUSSION

This patient had a combination of two conditions associated with a very poor prognosis: necrotizing fasciitis, a rare disease with a poor life expectancy by itself and mediastinitis that has a reported mortality of 21–40% [3]. This combination progressed in a rapid and deteriorating manner that led to his death despite a multidisciplinary and aggressive effort that started 3 days after the application of the ointment.

Of particular importance is the fact that we could not find a similar case of associated necrotizing fasciitis and mediastinitis

Figure 1: (A) Patient at arrival to the ER. (B) Patient 48 h after arrival to the hospital.

Figure 2: (A) Computed tomography scan demonstrating a bilateral pleural effusion, mediastinal adipose tissue heterogeneity. (B) Patient after thoracic fasciotomy.

related to the use of rattlesnake ointment; our patient also had thrombocytopaenia and coagulopathy, probably related to the rattlesnakes' venom due to its haemotoxic effects, the patient did not present the neurotoxic venom component described in some rattlesnakes like the Mojave rattlesnake known as the Mojave Type A toxin [4]. The problem can be contemplated as derived from the rattlesnakes' tissues and fluids or as a lethal soft tissue infection caused by unidentified bacteria, probably Group A *Streptococcus*, rapidly extending into the mediastinum, for which there are only five reported cases in the literature [5], most of them with deadly results similar to our case.

The relationship between the rattlesnake ointment application and the fasciitis appears certain, although it is unclear if one of the components derived from the snake, a significant bacterial contamination of the preparation or both, absorbed through the skin, were the real culprits of the initial problem which was followed by the mediastinal infection. In one way or the other, there is no guarantee that medications used in folk medicine are prepared in an orthodox manner and fulfilling all sanitary

requirements [6]. Unfortunately, the contrary appears to be true and the rule.

Conflict of interest: none declared.

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