Necrotising fasciitis due to *Absidia corymbifera* in wounds dressed with non sterile bandages

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ABSTRACT

We present three cases of *Absidia corymbifera* necrotising fasciitis presenting to our centre within 1 month of each other. All patients had wound dressings with non sterile crepe bandages at peripheral centres. One patient was lost to follow-up, another improved on timely antifungal therapy, while the last patient succumbed to disseminated infection. We propose that traumatic and deep wounds be dressed with sterile roller bandages to prevent outbreaks of wound zygomycosis.

**Key words:** *Absidia* • Bandages • Necrotising fasciitis

INTRODUCTION

*Absidia* spp. are thermophilic zygomycetes ubiquitous in soil (1). *Absidia corymbifera*, the only pathogenic species, is relatively less commonly isolated from clinical specimens, being responsible for only 3% of zygomycoses (2). Infection is usually acquired by inhalation or contamination of wounds with sporangiophores, because Mucorales are incapable of infecting intact skin. The spectrum of cutaneous zygomycosis ranges from locally invasive disease to necrotising fasciitis and secondary vascular invasion leading to dissemination with the latter two associated with a very high mortality (2).

Risk factors for cutaneous zygomyces include diabetes, immunosuppression (neutropenia or steroid-induced neutrophil dysfunction) or traumatic inoculation of sporangiophores through soil or contaminated dressings (1,2).

We report three cases of cutaneous *Absidia* infections, all seen in healthy immunocompetent patients with wounds dressed in peripheral clinics with crepe roller bandages.

**CASE REPORTS**

**Case 1**

A 36-year-old previously healthy gentleman, resident of Ghotki city in Pakistan, presented in late November 2009 to the Infectious Disease clinic with a complaint of non healing ulcer on the left thigh. The ulcer had evolved from a blister on the left thigh 3 months previously and he had undergone three debridements in the previous 3 months at a local clinic in Ghotki...
Key Points

- On presentation, there was a 5 cm deep wound on the posterior left thigh with foul-smelling pus and necrotic margins.
- Pus culture grew methicillin-resistant Staphylococcus aureus and outpatient parenteral therapy was started with vancomycin and piperacillin-tazobactam along with daily oxoferrin dressings with sterile gauze.
- One week later, he was readmitted with fever, tachycardia and persistent pus discharge from the wound, which had now extended to a depth of 10 cm with frank bleeding and exposed femoral and popliteal vessels.
- On examination, the wound had been dressed with crepe roller bandage.
- Debrided tissue was sent for histopathology and culture showed aspergillus hyphae with angioinvasion.
- The patient was advised an above-knee amputation but owing to financial constraints and disagreement with the decision to amputate, the patient left the hospital against medical advice and was later lost to follow-up.

Case 2

A 40-year-old previously healthy gentleman, resident of Nawabshah, Pakistan, presented in December 2009 with a 10 × 8 cm necrotic lesion on the left upper arm. This had developed 10 days after the patient received an injection into the left deltoid. Abscess formation within 5 days was followed by a visit to the local clinic where a nurse incised and drained the abscess and dressed the wound with crepe roller bandage. Areas of necrosis developed in the wound within 3 days and he presented with an extensive lesion described above. On presentation, the patient was vitally stable, but given the rapidly evolving lesion, the wound was immediately debrided. A tissue examination showed broad aseptate hyphae with thrombosis and angioinvasion (Figure 2).

Cultures grew A. corymbifera. The patient was discharged on intravenous amphotericin B deoxycholate at 1.5 mg/kg/day. On follow-up 1 month later, he was receiving daily sterile dressings with local amphotericin washes and the wound had improved albeit with secondary healing and scarring.

Case 3

Thirty-five-year-old gentlemen, a resident of Karachi, presented in late December 2009 at the emergency room after a road traffic accident. He had sustained multiple injuries including from a blister on the left thigh 3 months previously and he had undergone three debridements in the previous 3 months at a local clinic in Ghotki. On presentation, there was a 5 cm deep wound on the posterior left thigh with foul-smelling pus and necrotic margins. An ultrasound Doppler was normal for vascular patency. Pus culture grew methicillin-resistant Staphylococcus aureus and outpatient parenteral therapy was started with vancomycin and piperacillin-tazobactam along with daily oxoferrin dressings with sterile gauze. One week later, he was readmitted with fever, tachycardia and persistent pus discharge from the wound, which had now extended to a depth of 10 cm (Figure 1A) with frank bleeding and exposed femoral and popliteal vessels. The patient expressed concern over the adequacy of daily dressings, which were performed at a peripheral clinic. On examination, the wound had been dressed with crepe roller bandage. A vascular evaluation found the peripheral vascular system to be intact with a normal ankle-brachial index and good capillary refill. Urgent debridement was planned and debrided tissue sent for histopathology and culture showed aseptate hyphae with angioinvasion (Figure 1B). Culture grew A. corymbifera. Treatment with intravenous amphotericin B deoxycholate was initiated at a dose of 1.5 mg/kg/day and the patient was advised an above-knee amputation. However, owing to financial constraints and disagreement with the decision to amputate, the patient left the hospital against medical advice and was later lost to follow-up.

Figure 1. Case 1: (A) 10 cm deep soft tissue defect seen in the popliteal and infrapopliteal region of the left lower limb. Biopsy from the ulcer edge (B) shows fibrofatty tissue with dense acute inflammation with numerous aseptate hyphae (arrow).
a Leforte II fracture leading to left proptosis and C3 cord contusion. His scalp and facial laceration was dressed with crepe bandages at a peripheral centre (Figure 3A). At the tertiary-care hospital where he presented, his left eye was enucleated. On the ninth postoperative day, the scalp wound was noticed to be expanding with a necrotic patch. Debrided tissue from the wound showed thrombosis and angioinvasion by aseptate hyphae (Figure 3B) and cultures grew \textit{A. corymbifera}. Amphotericin B deoxycholate was started at a dose of 1-5 mg/kg/day; however, the patch progressed to necrotising fasciitis. The patient was managed with repeated debridements and intravenous amphotericin was continued. Twelve days after the lesion was first noticed, the patient developed acute respiratory distress with chest roentgenogram findings suggestive of pulmonary oedema (Figure 3D). He was intubated and shifted to the intensive care unit. A Gram stain of the tracheal aspirate showed numerous Gram-negative coccobacilli with rare aseptate hyphae (Figure 3C) and cultures grew \textit{Acinetobacter baumannii}. However, the aseptate hyphae failed to grow. Two days later, the patient died after an episode of refractory hypotension.

**DISCUSSION**

\textit{A. corymbifera} is a rare cause of primary cutaneous necrotising fasciitis. Cases are usually seen in previously healthy individuals (3). There are, however, a few reports previously of \textit{Absidia} infections associated with surgical bandages (3,4). This was also the probable route of wound contamination in all three of our patients. However, we could not trace the source of contamination as all three patients came from different cities peripheral to Karachi. We therefore cultured five different brands of crepe roller bandages available in peripheral clinics for fungi. Three bandage sets from each brand were tested. Nonsterile crepe roller bandages showed growth of \textit{Bacillus} spp. on 5\% sheep blood agar (SBA). No growth of fungi was noticed on either SBA or Sabouraud’s agar (SDA) even after 7 days of incubation. Since Christiaens \textit{et al.} had reported difficulty in growing \textit{Absidia} from bandages on SDA, and had reported ease of growth on malt-extract agar with chloramphenicol (4), we used the same medium for this purpose. Although \textit{A. corymbifera} was not cultured from any of the crepe bandages, three of five brands cultured grew \textit{Aspergillus} spp. on this medium. Although the wound-care regimes in all three patients point to non sterile crepe roller bandages as the source of contamination, we could not prove that this in fact was the case. It was also not possible to examine the same brands as were used in all three patients because dressings with crepe bandages were carried out at unregistered peripheral centres with no pharmacy inventories. However, because the bandages we cultured contained \textit{Aspergillus} spp. and \textit{Bacillus} spp., it can be said that these were colonised by environmental organisms and therefore likely to have harboured \textit{Absidia} spp. as well. This is especially plausible because all three cases were temporally clustered. Also, \textit{A. corymbifera} is not a commonly isolated mould. Our laboratory-based data for all zygomycetes reported from clinical specimens in the last 10 years shows \textit{Mucor} spp. to be the commonest followed by \textit{Rhizopus} spp. and \textit{Rhizomucor} spp. Previous reports of mucormycosis from Pakistan also support this data (5,6).

Necrotising fasciitis as a result of zygomycetes approaches a mortality rate of 80–94\% (2,3). All three of our patients had signs of necrotising fasciitis at diagnosis, and although we lost the first patient to follow-up, the prognosis is likely to have been grave because of the rapid deterioration of the wound. The second patient in our series was improving on follow-up and this may well be because of urgent debridement on presentation, and compliance with adequate dressing and antifungal

![Image](image-url)

**Figure 2.** Case 2: Histopathology of left upper arm necrotic tissue showing extensive necrosis with dense active inflammation and numerous aseptate hyphae (arrow).

**Key Points**

- on follow up 1 month later, he was receiving daily sterile dressings with local amphotericin washes and the wound had improved albeit with secondary healing and scarring
- case 3: thirty-five-year-old gentleman, a resident of Karachi, presented in late December 2009 at the emergency room after a road traffic accident

- his scalp and facial laceration were dressed with crepe bandages at a peripheral centre
- on the ninth postoperative day, the scalp wound was noticed to be expanding with a necrotic patch
- debrided tissue from the wound showed thrombosis and angioinvasion by aseptate hyphae
- amphotericin B deoxycholate was started
- the patch progressed to necrotising fasciitis
- twelve days after the lesion was first noticed, the patient developed acute respiratory distress with chest roentgenogram findings suggestive of pulmonary oedema
- the patient was transferred to Intensive Care
- A Gram stain of the tracheal aspirate showed numerous Gram-negative coccobacilli with rare aseptate hyphae
- the cultures grew \textit{Acinetobacter baumannii} but the aseptate hyphae failed to grow
- two days later, the patient died after an episode of refractory hypotension
- \textit{A. corymbifera} is a rare cause of primary cutaneous necrotising fasciitis
- there are, however, a few reports previously of \textit{Absidia} infections associated with surgical bandages
- this was also the probable route of wound contamination in all three of our patients

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Key Points

- we cultured five different brands of crepe roller bandages available in peripheral clinics for fungi
- non sterile crepe roller bandages showed growth of Bacillus spp. on 5% sheep blood agar (SBA)
- no growth of fungi was noticed on either SBA or Sabouraud’s agar (SDA) even after 7 days of incubation
- although the wound-care regimes in all three patients point to non sterile crepe roller bandages as the source of contamination, we could not prove that this in fact was the case
- however, because the bandages we cultured contained Aspergillus spp. and Bacillus spp., it can be said that these were colonised by environmental organisms and therefore likely to have harboured Absidia spp. as well
- Necrotising fasciitis as a result of zygomycetes approaches a mortality rate of 80–94%

Figure 3. Case 3: (A) Soft tissue swelling with surgical dressing (arrow) seen on skull radiographs of the patient taken on admission. Tissue biopsy (B) taken from the same site on the ninth day of admission shows subcutaneous adipose tissue with degeneration of collagenous tissue, acute inflammation and angioinvasion by aseptate hyphae (arrow) on histopathology. Tracheal aspirate gram stain taken on the 21st day of admission showing numerous gram negative cocccobacilli and aseptate hyphae (C), with chest X-ray (D) showing bilateral infiltrates and air bronchogram suggestive of disseminated fungal infection.

medication regimens. The third patient suffered from disseminated infection despite debridements and antifungal therapy. Factors contributing to this patient’s mortality include delayed recognition of the infection, infrequent or less aggressive debridements, underlying patient factors (such as borderline immunoincompetence because of acidosis and hyperglycaemia) or primary antifungal treatment failure. The latter is unlikely given the timely and adequate antifungal therapy.

Dressing regimes vary according to type of wound, patient preference and surgeon expertise (7). Post-traumatic and dirty wounds are often dressed with gauze and secured with crepe bandages, which as we have also showed, are non sterile and may harbour primary cutaneous pathogens. A. corymbifera infection in our patients was associated with such non sterile dressings in contact with the wounds. We propose that dressings be undertaken with sterile roller bandages, wherever possible and that these are made available to pharmacies on a larger scale to avoid seeding wounds with opportunistic fungi.

REFERENCES
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