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Non healing legs ulcers infected with Stenotrophomonas maltophilia

Stenotrophomonas maltophilia (S.M.) is a Gram-negative bacillus, naturally resistant to cephalosporins and carbapenems, which can colonize different sites and may be responsible for serious infections for which treatment is a real challenge. This was rarely reported as cutaneous pathogenic organism causing cellulitis-like lesions, paronychia, mucocutaneous ulcers and ecthyma gangrenosum in immunocompromised individuals. We report a case of non-healing legs ulcer infected with Stenotrophomonas maltophilia.

KEY WORDS: Antibiotic resistance Stenotrophomonas maltophilia; Bionect Start ® ointment; Serious infections; Stenotrophomonas maltophilia.

Introduction

Stenotrophomonas maltophilia has emerged as an important opportunistic pathogen in debilitated hosts. Clinical management of S. maltophilia is challenging due to its intrinsic resistance to a variety of antibiotics [1-2]. It has emerged as an important opportunistic pathogen in debilitated hosts, including patients with cancer, chronic obstructive pulmonary disease, cystic fibrosis and prolonged mechanical ventilation. The most common manifestations of S. maltophilia infection are pneumonia and blood-stream infections and, less frequently, wound and urinary tract infections. Risk factors for S. maltophilia infection include use of indwelling devices, exposure to broad-spectrum antimicrobials, long hospital stays, chemotherapy-induced neutropenia of long duration, mucositis, and receipt of total parenteral nutrition [3-5]. Surveys in recent years showed an increasing isolation rate for S. maltophilia, probably due to increasing population of patients at risk.[2] Infections caused by S. maltophilia are associated with high mortality rates.

Case report

A 92-year-old woman presented to us with two non-healing right and left leg ulcers. The patient affected with vascular dementia, reported a history of chronic lower limb arterial disease, high blood pressure treated with 10mg β-blockers, decreased visual acuity after surgery for bilateral glaucoma. Also refers an episode of TIA at the age of 65 years, followed by the onset of an epileptic syndrome being treated with Carbamazepine 200mg. She reports a history of unspecified lung disease and the presence of calcified nodules of 4 mm in diameter in the left upper lobe, 3 mm wide and 3 mm right upper lobe to lower lobe, for which she is subjected to oxygen therapy. The patient had suffered ten years earlier intervention for correction of hallux valgus and two

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weeks after the amputation of the second finger of his left foot. The patient dates the onset of the clinical picture to about a year ago when he noted the appearance of trophic lesions in the right lower limb, in the absence of digital necrosis of the toes. She made regular medications without improvement, therefore, was hospitalized on 22.08.2011 at the Departement pathophysiological of vascular surgery at the Umberto I in Rome. The patient performed a CTA (computed tomography angiography) of the peripheral blood that exhibited several alterations in atherosclerotic abdominal aorta, celiac trunk, renal arteries bilaterally, common iliac arteries, iliac internal and external, superficial femoral, popliteal left. The CTA also showed multiple appositions parietal fibro-calcified, leading to focal occlusion along their course, with collateral circulation in the pre-malleolar. The circle of the right leg was supported by anterior and posterior tibial arteries, which exhibited some wall plaques partially stenosing the files in their proximal and distal occlusion of the interosseous artery. The patient underwent arteriography of the lower left corner with percutaneous transluminal angioplasty (PTA) of the superficial femoral, popliteal PTA's, recanalization of the anterior tibial, anterior tibial and dorsalis pedis PTA. The right lower limb revascularization attempt was unsuccessful. Although the frequent medications the patient showed deterioration of ulcerative lesions in the legs and the general condition, for which it was run on 25/1/2012 buffer that showed the presence of infection with Staphylococcus aureus, Pseudomonas aeruginosa and Enterococcus faecalis. On 08/03/2012 the patient was discharged with a diagnosis of chronic lower limb arterial disease with the presence of extensive ulcerative lesions of the right leg infected dependents. The patient presented to our observation at the outpatient clinic difficult wounds, the Department of Plastic Reconstructive and Aesthetic Surgery of the Policlinico Umberto I in Rome, for the treatment of the case. At the level of the right leg there was very extensive circumferential exuding ulcer, with extensive areas of humid and dry necrosis, copious exudate and fibrinous material, with erythematous halo surrounding skin, smelly, sore and painful on palpation. The lesion occupied the entire leg to the heel, a diameter of about 40X30 cm, with indefinite margins. The fund had a necrotic ulcer with exposed muscle and tendon structures. The lesion occupied the entire leg to the heel bone, the margins were undefined, with the surrounding skin erythema. (Fig. 1, Fig. 2, Fig. 3, Fig. 4) At the level of the left leg were present some ulcerative lesions of smaller diameter than the previous, covered by eschars and erythema of the surrounding skin. The skin of the leg as a whole showed trophic injuries and dehydration. (Fig. 1, Fig. 2, Fig. 3) In the lower projection was noted ulcer larger, with a diameter of 20 x 8 cm^2, more superficial and exuding less than that of the right leg. (Fig. 5) We carried out a biological buffer (antibiogram) that shows moderate growth of S. maltophilia. (Fig. 6) We started the treatment of patients with cotrimoxazole. We ran regular medications: disinfection with Sodio hypochlorite 0,05% cuta-

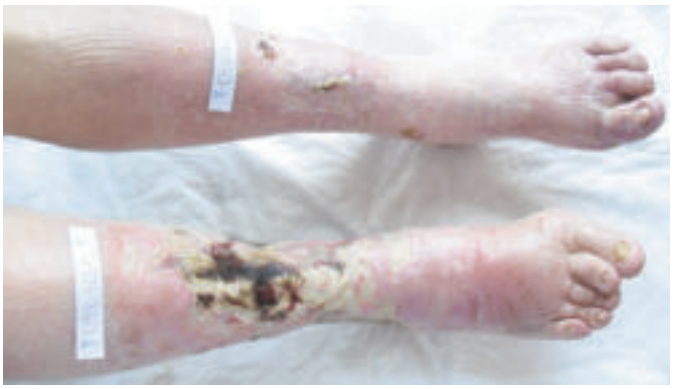

Fig. 1: Frontal view, right and left legs.

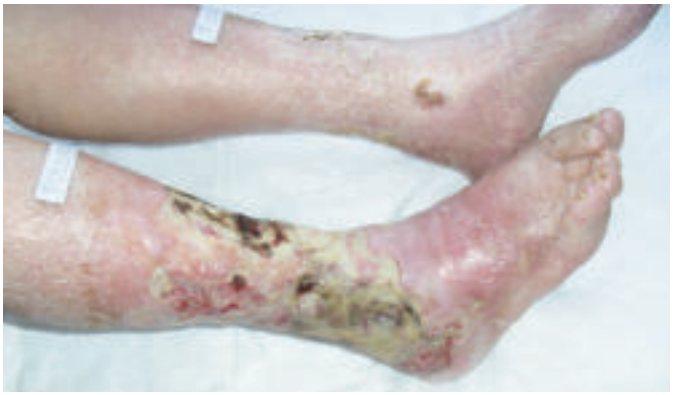

Fig. 2: Right lateral view.

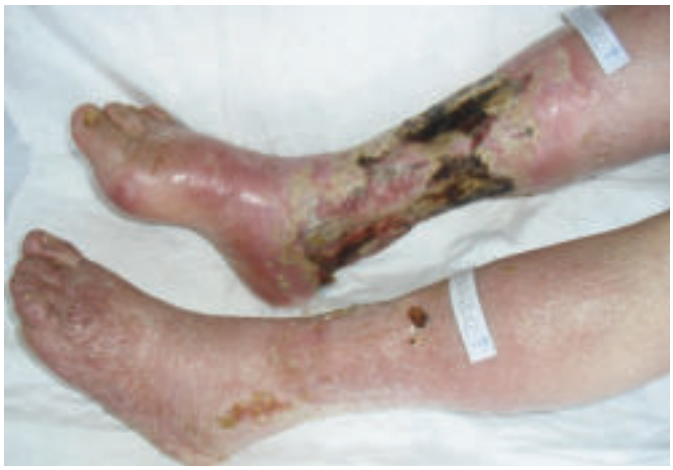

Fig. 3: Left lateral view.

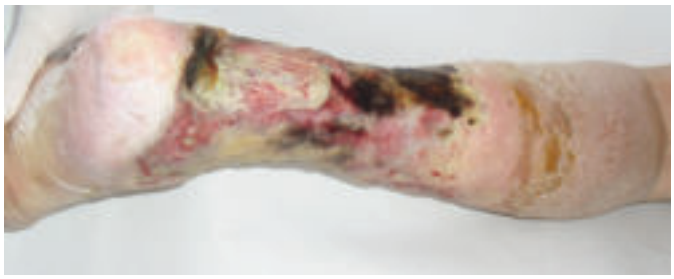

Fig. 4: Shorter view, right leg.

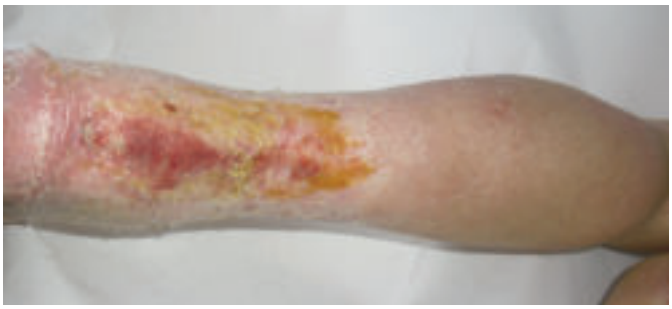

Fig. 5: Shorter view, left leg.

neous solution (Amukine Med 0.05%, Amuchina S.p.A., Genova-Italy) and cutaneous solution based on 10% povidone iodine (Betadine ® 10%, Meda Pharma S.p.A., Milano-Italy), cleansing with saline solution and application of 2 mm Bionect Start ® ointment (Fidia Pharmaceutical, Abano Terme-Italy), covering the wound with sterile gauze, Germany's cotton and elastic bandage.

Bionect Start ® is a topical cream containing hyaluronic acid, bacterial fermented sodium hyalunorate (0,2% w/w) salt and bacterial collagenase obtained from non-pathogenic *Vibrio alginolyticus* (>2,0 nkat[1]/g) [6] The use of collagenase is based on performing lysis of fibrin and necrotic tissue. The topical administration of collagenase increases the effect of macrophagic collagenase, which are responsible for wound debridement by splitting and breaking down proteins which hold eschar (dead and devitalised material) on the wound. [7-9]. This collagenase also contains hyaluronic acid (HA) [9] which above all generates a microenvironment stimulating the secretion of growth factors, proliferation and migration of fibroblasts, endothelial cells, keratinocytes and angiogenesis [10,12] and has a positive effect on the inflammatory response[10-12]. Moreover HA is also capable of regulating the water balance acting on osmotic pressure and flow resistance and selectively sieving the diffusion of plasma and matrix proteins [13].

Despite our precautions and care the patient showed worsening of clinical conditions for which patients required surgical amputation of his right leg and left thigh.

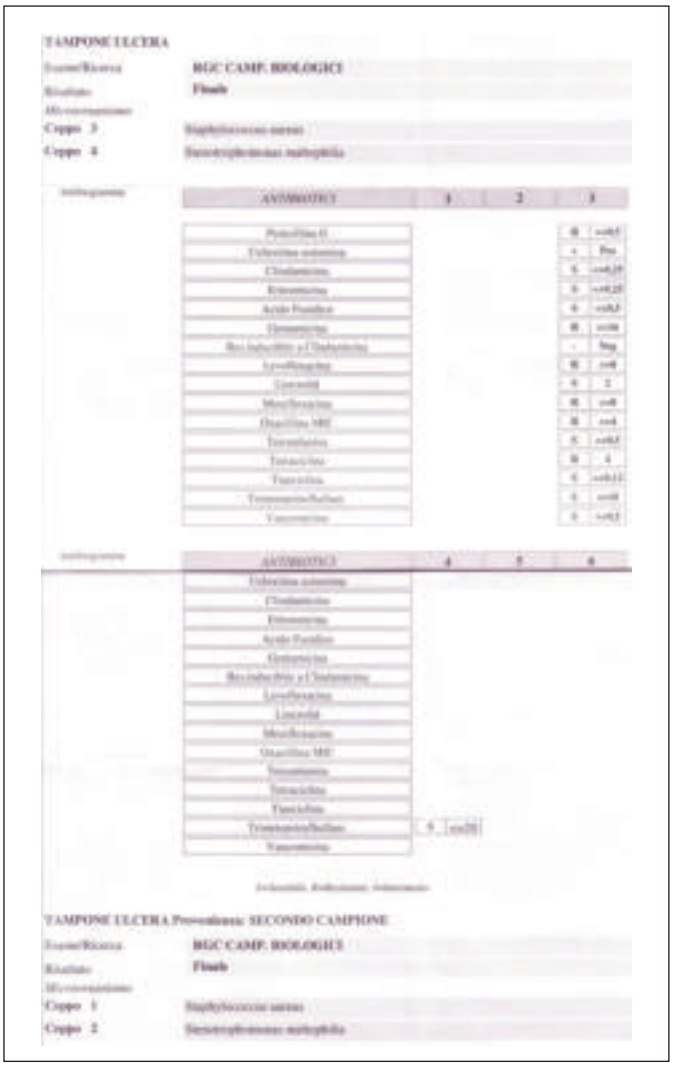

Fig. 6: Biological buffer (antibiogram).

Discussion

S.M. is a Gram-negative bacillus, bacilli, related to Pseudomonas aeruginosa. It is an ubiquitary bacterium, an opportunistic pathogen that can survive that in almost all humid environments, including water, soil and plants. It is known that this bacterium can survive and multiply in aquatic environments, in particular in hospitals. The main predisposing factors for developing infection with S.M. are: prolonged hospitalization, especially in Intensive Care Unit, the prosthesis, the bladder catheter, the use of broad spectrum antibiotics and immunodeficiency [1]. The management of patients suffering from chronic ulcers represents a significant problem for its high frequency and the complexity of the cases [14]. Chronic wound can have several etiologies such as traumatic, complicated surgical wounds, pressure/ decubital ulcers, skin ulcers caused by arterio-venous disease, dia-

betes and others [14,15]. To date, despite the several therapeutic available options, the treatment of difficult wounds remains an hard challenge [16,17]. In our case, indeed, the presence of non-healing legs ulcers favored the infection by the S.M [16-20]. Some epidemiological studies report that S.M. is the second Gram-negative bacillus responsible for nosocomial infection after Klebsiella pneumoniae. The respiratory location of the bacterium is typical. The treatment remains very hard because of this bacterium's drug multiresistance [1]. About treatment, MS is resistant to many antibiotics such as aminoglycosides, beta-lactams and carbapenems. Quinolones and trimethoprim-sulfamethoxazole (TMP-SMZ) are cited as effective antibiotics. Based on studies of sensitivity, SMZ-TMP (TMP at a dose of 2 to 3.5 mg / kg / day and SMZ at a dose of 15-20 mg / kg / d) is the drug of choice because it is active against the most bacterial strains. However, recent data indicate that the percentage of resistant strains seems to be increasing.[1] Of the antibiotics that are commonly investigated for in vitro activity against S. maltophilia, trimethoprim/sulfamethoxazole (TMP-SMX), fluoroquinolones, ticarcillin-clavulanic acid and minocycline appear to be the most active with lower minimal inhibitory concentrations (MICs). Nevertheless, trends of increasing resistance to antimicrobials such as TMP-SMX and ticarcillin-clavulanic acid have been recently reported.[2] A study evaluated the susceptibility of clinical S. maltophilia isolates collected over a 10-year period in Taiwan. They found that the activities of TMP-SMX and minocycline remained similarly high over the years. However, the activity of levofloxacin against S. maltophilia has declined. In addition, TMP/SMX-resistant isolates were significantly less susceptible than TMP/SMX-susceptible isolates to levofloxacin [2].

Conclusion

Skin and soft tissue infections of S. maltophilia are increasing and are most frequently associated with post-traumatic, post-surgical or burn-related wounds and chronic cutaneous ulcers. Clinical manifestations include cellulitis, cellulitis-like skin lesions, infected muco-cutaneous ulcers, ecthyma gangrenosum and paronychia [4-5]. S. maltophilia skin infection should be included as a differential diagnoses for skin lesions, especially when pus culture shows S. maltophilia, to start an appropriate antibiotic therapy [3]. Our case is unique, not only because it is one of the second case of leg ulcer caused by community acquired, S. maltophilia infection, but also because of its unusual occurrence in immunocompetent patient. Infections caused by S. maltophilia are particularly difficult to manage because they show resistance to many classes of antimicrobial agents. In contrast with the case of patient with ulcers infected with S.M. reported in literature[3], in our case, situation's seriousness, despite antibiotic therapy and correct dressings, forced us to perform the amputation.

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Riassunto

Stenotrophomonas maltophilia (SM) è un bacillo Gram-negativo, naturalmente resistente alle cefalosporine e carbapenemi, che è in grado di colonizzare siti diversi e può essere responsabile di gravi infezioni per le quali il trattamento è una vera e propria sfida. Questo è stato raramente segnalato come un organismo patogeno che causa lesioni simili alla cellulite, paronichia, ulcere muco-cutanee ed ectima gangrenoso in individui immunocompromessi. Riportiamo un caso di ulcere degli arti inferiori refrattarie alla guarigione infettate da Stenotrophomonas maltophilia.

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