CASE REPORT

SUCCESSFUL TREATMENT OF MULTIDRUG-RESISTANT ACINETOBACTOR BAUMANII BLISTERS ON THE KNEE

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Acinetobacter baumannii (*A. baumannii*), nosocomial infections, especially those due to multi-drug resistant (MDR) strains, are increasingly detected. This study reports the case of a 50 year old man with blisters on the right knee for 8 months, first admitted through the outpatient department for incisional biopsy. Microbiological and histo-pathological examination confirmed the diagnosis of blisters extending deeply up to the knee joint caused by MDR- *A. baumannii*. A broad spectrum antibiotic therapy was administered and later readjusted according to the results of microbiological culture and biopsy report. Intensive hemodynamic support was required. An extensive surgical debridement was promptly performed and repeated until complete control of the infection with intravenous colistins. Blisters were excised; wounds were dressed daily with chlorhexidine dressings and polymyxine-impregnated dressing. Wounds were finally covered with split-thickness skin grafts. The infection was overcome 120 days after admission. The graft take was 40%. Postoperative rehabilitation was required because of the functional limitation of lower limb movements at the knee joint. Follow-up at 8 months showed no functional deficit and an acceptable aesthetic result. AB-MDR affecting soft tissues is a life-threatening disease, especially in patients with poor immunity and limited access to health facilities, whose clinical diagnosis may sometimes be challenging. Early recognition and treatment represent the most important factors influencing survival.

Keywords: *Acinetobacter baumannii*, Colistin, Chlorhexidine

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INTRODUCTION

Acinetobacter baumannii, the gram-negative coccobacillus, is ubiquitous in nature. This organism can survive for months together on inanimate surfaces as well as on human skin and mucous membranes, making nosocomial transmission extremely difficult to prevent.[1] It has emerged as the third most common nosocomial pathogen among gram negative organisms, responsible for serious infections and nosocomial outbreaks. It affects particularly the patients who are critically ill or/and have underlying debilitating diseases. It can cause significant health problems in the elderly, with high rates of mortality due to severe and fatal infection involving the respiratory tract, the urinary tract, and wounds and bacteraemia (including catheter-associated blood stream infection). The risk factors usually constitute underlying diseases, intravascular lines (I/V), mechanical ventilation, old age, prior treatment with broad-spectrum antibiotics or steroids (including immune-compromised status), prolonged hospitalization, and stay in the intensive care unit (ICU). *A. baumannii* has an intrinsic propensity to acquire multiple drug resistant genes; and whole-genome sequencing of resistant strain has proven this.[2] In addition, liberal use of carbapenems and third generation cephalosporin appears to be related to the development of multi-drug resistant strains, which helps in turning them into pan-resistant. Such phenotypes are known to harbour extended-spectrum β-lactamase (ESBLs) and metallo-β-lactamase (MBLs).[2,3]

CASE REPORT

This study reports the case of a 50 year old man with blisters on the right knee for 8 months, first admitted through the outpatient department (OPD) for incisional biopsy. This patient was previously being treated at Pakistan Institute of Medical Sciences Islamabad (PIMS) for 1 year. During his stay at PIMS, he was repeatedly investigated with Culture and Sensitivity (C/S) done several times, but all reported no growth. Initially when he presented to OPD of Surgical Unit-B at Ayub Teaching Hospital Abbottabad, an incisional biopsy along with puss was taken and sent for histopathology. It was reported as “Chronic active inflammation consistent with pus” and culture for Actinomycosis was suggested.

Another biopsy and pus for culture were planned and sent. It was reported as “Skin tissue showing acute and chronic inflammation and bacterial colonies resembling Actinomyces”. On Culture no organism was yielded. Empirical treatment was started for Actinomycosis but there was no response despite of 4 weeks treatment and blisters kept on increasing in size and number. Meanwhile dermatologists were consulted and ultimately it was decided to drain all the

blisters (consistent with pus) and extensively debride the wound and wash with antiseptic solutions.

The blisters were drained and excised *in toto*, resulting in complete denuding of the knee joint. Specimen was sent for workup. A broad spectrum antibiotic therapy was administered and later readjusted according to the results of microbiological culture and biopsy report. Wounds were dressed daily with chlorhexidine dressings and polymyxine-impregnated dressing.

Microbiological and histopathological examination confirmed the diagnosis of blisters extending deeply up to the knee joint caused by Multi Drug Resistant *A. baumannii* and sensitivity reported susceptibility only to Colistins and Tigecycline.

Intensive hemodynamic support was required. An extensive surgical debridement was promptly performed and repeated until complete control of the infection. The wound responded promptly to intravenous Colistin therapy. Wounds were finally covered with split-thickness skin grafts. Grafts was partial thickness and taken from contralateral thigh.

The infection was overcome 120 days after admission. The graft take was 40%. Postoperative rehabilitation was required because of the functional limitation of lower limb movements at the knee joint. Follow-up at 8 months showed no functional deficit and an acceptable aesthetic result.

Figure-1: Blisters around knee joint

Figure-2: After Grafting

DISCUSSION

Multi-drug Resistant *A. baumannii* is emerging as opportunistic organism worldwide. It has been reported as a major cause of Intensive Care Unit outbreaks, mostly affecting the immune-compromised patients.[4] MDR-AB is a major cause of nosocomial infections and has been identified as culprit in causing Pneumonia[5], acute respiratory distress syndrome (ARDS)[5], Necrotizing Fasciitis[6], Ventriculitis[7], Mediastinitis[8], and Cerebral Abscess[9].

Although rare, community acquired infections have been reported on occasions. To our knowledge, there is no published report on Community Acquired Pan-resistant *A. Baumanii* infection that caused soft tissue infections, multi-organ involvement, and septic shock.[10]

The isolate did not show susceptibility to any of the common anti-Acinetobacter agents. Polymyxins (colistin and polymyxin-B) have saved the lives of severely infected patients and have been increasingly used as a last resort in fulminating infections due to MDR- *A. baumannii*.[11] In the present case, no underlying chronic disease or ailment was found which can be linked to predisposition or immune-compromised state.

The antibiotic susceptibility patterns clearly suggested that the isolates were Multi-Drug Resistant (MDR). The prominent risk factors in this case, such as ICU stay, intravenous catheterization, and haemodialysis, can be ruled out and thus community-acquired *A. baumannii* infection is favoured more.[10]

Many virulence factors conferring antibiotic resistance have been linked to MDR status of this organism, which were thought to contribute to its pathogenicity. Antibiotic resistant-unrelated pathogenicity and associated virulence factors are largely unknown and need further research. At the same time, it is reported that *A. baumannii* had moderate growth at 48 hours period and it also devotes a considerable portion to pathogenicity and virulence.[11,12]

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