

Negative pressure treatment for necrotizing fasciitis after chemotherapy

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Abstract

We describe 2 cases of children with malignant disease who developed severe mucositis with perineal necrotizing fasciitis during severe neutropenia after chemotherapy. Treatment with topical negative pressure therapy with silver foam dressing, together with large spectrum antibiotics, resolved the problem with complete closure of the wound after 30 and 36 days of treatment, respectively.

Introduction

We describe 2 cases of children with malignant disease who developed severe mucositis with perineal necrotizing fasciitis (NF) during severe neutropenia after chemotherapy. Treatment with topical negative pressure therapy with silver foam dressing, together with large spectrum antibiotics, resolved the problem with complete closure of the wound after 30 and 36 days of treatment, respectively. Necrotizing fasciitis is a rare event in pediatric patients. However, several cases have been reported in literature in children with malignant disease.

Case Report #1

A 20-day old female (birth weight 2943g.) was admitted to our Neonatal Intensive Care Unit immediately after birth due to the presence of red-violaceous nodules on the whole body area and bone marrow aplasia. Histology of skin biopsy documented acute monoblastic leukemia (AML) treated according to the protocol for pediatric AML. During the neutropenic phase after chemotherapy, she presented severe mucositis in the perineal area and oral mucosa. Despite broad-spectrum antibiotics and G-CSF therapy the perineal lesion rapidly progressed into necrotizing fasciitis with culture positivity for *Pseudomonas Aeruginosa*; blood cultures were negative. The perineal lesion reached 18 cm² of square area and a rectum prolaxation

appeared. Treatment included large spectrum iv antibiotics, IVIG, total parenteral nutrition and inotropic drugs, and morphine iv. Antibiotics were modified according to culture results. Local surgical debridement of the eschar and application of polyurethane foam dressings were initially carried out, but because of the lack of improvement of the lesion and the persistence of swab positivity to *Pseudomonas*, treatment with a topical negative pressure device with GranuFoam Silver® dressing (V.A.C, KCI, San Antonio, TX, USA) was applied on the wound.¹ To achieve a uniform pressure gradient the foam was covered by polyurethane film. Topical negative pressure started at -50 mmHg and gradually rose to -75 mmHg. A total of 30 days of negative pressure treatment were required for closure of the lesion area; the anorectoplasty of the rectum was performed several months later.

Case Report #2

A 14-month boy with stage IV neuroblastoma underwent chemotherapy according to the SIOP NB-AR 01 study. After his third cycle of therapy during the severe neutropenia phase (WBC 0.28×10⁹/L) he developed a perineal lesion and fever. No previous mucositis skin/mucosal lesions nor diarrhea were present. After the appearance of the lesion, the patient promptly started iv antibiotic therapy with ceftazidime and amikacina, and G-CSF. Total parenteral nutrition was necessary. C-reactive protein (CPR) rose from 0.71 to 11.8 mg/dL within 12 h. A large area of inflammation with redness and hot skin together with intense pain developed over 12-24 h. After 36 h the inflammation area of the skin and subcutaneous tissue showed fast enlargement spreading across the fascial plane of the perineum and the right gluteal region until the internal femoral region. Blood culture was negative, as were swabs of the necrotic areas. After a few days, the patient needed surgical curettage with removal of eschar and necrotic tissue. Given the worsening and enlargement of the lesion, treatment with a topical negative pressure device with GranuFoam Silver® was applied on the wound. The negative pressure was gradually increased until -100 mmHg which the patient tolerated well. The wound was medicated every 2-3 days under sedation. To reduce contamination of the area, urinary and rectal catheters were in place until resolution. None of the cultures performed during curettage were able to identify a microorganism related to the lesion. Despite normalization of WBC, the patient did not show any improvement of the perineal lesion for several days; 36 days of topical negative pressure therapy were required to completely close the wound.

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Discussion

Necrotizing fasciitis is a rare event in pediatric patients. However, several cases have been reported in literature in children affected by malignancies, and it is well known that several predisposing factors may be involved in the pathogenesis of NF, such as injuries, immunodepression, and surgical procedures.²⁻⁴ Although *Staphylococcus Aureus* is recognized as the most common cause of NF; other microorganism such as gram negative bacteria may be responsible for the disease also in children.⁵ Prompt diagnosis and adequate treatment are mandatory. Treatment includes large spectrum iv antibiotics, intravenous immunoglobulin, as well as surgical debridement and removal of the necrotic eschar.⁵ Topical negative pressure is a procedure which has been recently introduced in the management of the wound and has proved useful in accelerating its closure due to the stimulation of granulation tissue, and improved angiogenesis process and blood flow.⁶ In our experience, topical negative therapy was well tolerated by the patients. In particular, it allowed constant debridement and removal of debris and secretions, and kept the wound area clean when other conventional techniques had failed to achieve wound closure.

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