



WOUND CARE CASE REPORT AT MAHAK'S PEDIATRIC CANCER TREATMENT AND RESEARCH CENTER

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between all authors. Author AM designed the study, wrote the protocol and interpreted the data. Author SSS anchored the field study, gathered the initial data and performed preliminary data analysis. Author NM managed the literature searches and produced the initial draft.

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Case Study

ABSTRACT

Therapeutic procedures of children with cancer lead to complexity in wound healing. The timing of surgery in combination with chemotherapy should be considered in children with malignancy, as the process of wound healing through current treatment is a critical challenge.

In this case report, we present a 2 year old male with Acute Myeloid Leukemia who had a surgery during induction phase of chemotherapy for port installation. Unfortunately this process makes a chronic wound in the right subclavicular region. Healing management was done by hydrocolloid formulated for the case. Eighteen days following wound healing, it was completely cured and there was only a scar tissue with the 0.1 mm depth.

Authors suggest the consideration of timing therapeutic modalities in patients with cancer, especially surgery procedures in combination with chemotherapy protocols. Otherwise in emergency situations, wound care management according to this case will be recommended.

Keywords: Cancer; chemotherapy; surgery; wound healing.

1. INTRODUCTION

Chemotherapy as a treatment modality in childhood malignancies significantly reduces the speed of wound healing [1]. Skin damage with varied degrees as a result of chemotherapy can be categorized as an acute or chronic wound [2]. The inflammatory response of these wounds can lead to cell death and then necrosis or sloughing of the tissue [3].

One of the disadvantages of induction chemotherapy is preoperative complications associated with the wound in pediatric malignancies. Different retrospective reports addressed that surgery for port utilization should be done after induction phase of chemotherapy. These studies revealed the safety of this action after induction chemotherapy [4-7].

Etiology of chemotherapy related wound healings are complicated [8]. Sufficient wound healing implies

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ordered interactions between cells [9]. Altering in managing acute wounds in pediatric malignancies can lead to problematic long-term care [2]. There can be an educational announcement for preventing the occurrence of these skin's problems during treatment of pediatric malignancies.

Here, we are reporting a case with a childhood malignancy who suffered a chronic wound that occurred because of surgery in induction phase of chemotherapy.

2. CASE PRESENTATION

AK, a 2 year old male with Down syndrome was referred to the MAHAK's Pediatric Cancer Treatment and Research Center (MPCTRC) with vomiting, cutaneous rash, petechiae and purpura. He was born by normal vaginal delivery from parents without consanguinity. There was breast cancer history in his third-degree-relative.

His flow-cytometry and bone marrow reports were in behalf of Acute Myeloid Leukemia (AML-non M3). AML-BFM-83 protocol was used for his chemotherapy. Twenty one days following his therapy through induction phase, he had a surgery for port installation.

2.1 Wound Assessment

Action of port installing led to a chronic wound in the right subclavicular region with a size of 12 cm × 5 cm × 0.5 mm (length × width × depth). Initially edema, erythema and afoul-smelling purulent drainage from the wound were noticed at the derma at the base of the wound. The accumulation of granulated and necrotic tissue of wound was considered.

2.2 Treatment Protocol

Sixteen days following port installation the exiting procedure was performed. Then after mechanical debriding, wound dressing applied designed for healing management was applied. Through these

performances, sterile dressing was achieved by DuoDERM CGF AquaCel Ag (a unique ConvaTec hydrocolloid formulated). Duration of healing management procedures were three days per week.

Finally, 18 days following the healing management, the wound was completely cured and there was only a scar tissue with the 0.1 mm in depth. Figs. 1 to 4 show the documentations through wound healing and it's the follow-up of the presented case.



Fig. 1. Day 3



Fig. 2. Day 9



Fig. 3. Day 10



Fig. 4. Day 20

The complete blood counts (CBC) of the patient at the times of port installation, exiting and recovery of wound healing were according to Table 1. During port installation and wound healing the systemic antibiotic therapies were administered with ceftazidime (75 mg/Kg every 8 hours) and vancomycin (80 mg/Kg every 6 hours). Through these days the microbial cultures of the wound were negative. At last, the patient died because of not responding to the chemotherapy protocol.

Table 1. CBC of patient at different time points

CBC counts	Port installation	Port exiting	Recovery of wound
WBC	3.8 K/ μ L	5.3 K/ μ L	5.5 K/ μ L
Neut	1 K/ μ L	2.3 K/ μ L	3.1 K/ μ L
RBC	3.80 M/ μ L	3.72 M/ μ L	4.25 M/ μ L
Hgb	10.3 g/dL	10.3 g/dL	11.6 g/dL
Plt	42 K/ μ L	10 K/ μ L	42 K/ μ L

3. DISCUSSION

Multimodal protocols in cancer therapy make a critical matter in wound healing [10]. Patients with cancer receiving chemotherapy and other medications are at risk of acute or chronic wounds [1]. Administration of anti-cancer agents has had a major concern with their effect on wound healing [10]. Chemotherapy in conjunction with surgery will target all rapidly dividing cells, tissues, macrophages and fibroblasts which are involved in wound healing [10]. In spite of chemotherapy agents, surgery procedures like port installation will be a critical challenge due to wound formation in the patient [6].

This type of wounds can be an emotional and physical challenge for the patient, parents and clinicians [10]. Once the wound develops, the perfusion of the tissue will alter and the mass will expand so the center of the tumor will become hypoxic which leads to tumor necrosis [9]. Different reports discussed the role of platelets, neutrophils, macrophages and T-lymphocytes in the repairing procedure of wound healing [11]. Recovery of neutrophils plays an important role in the wound healing [12]. Generally, progression of wound healing relates to anatomical and functional integrity of the tissue [10]. Any interventions and therapies that alert this progression will interfere with wound healing [11].

Different surgical procedures during chemotherapy cycles cause wounds that make surgeons aware of many factors which can interact with the healing of wounds [10]. Full comprehension of wound healing procedures and the chemotherapy agents' effect on it can help to improve therapy plans with lower risks to the patient [10].

4. CONCLUSION

For this way in assessing and controlling wounds, authors suggest that the timing of surgical intervention during chemotherapy is important in creating and managing wounds. Consequently, physicians should coordinate the treatment modalities especially during surgical processes during chemotherapy phases to control and manage wounds in patients with malignancy. Otherwise, in situations with urgent need for surgery like port installation, wound care at the time of formation is recommended.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties)

for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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