

Extended Arm Necrosis by Chemotherapy Drugs Extravasation

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Abstract

Complications of chemotherapy stem from the toxicity of products used and complications related to the modes and routes of administration of these products. To minimize the risks associated with the latter, due to the toxicity of the drugs administered and the long duration of treatment requiring repeated access to the venous system, the use of implantable venous access port is recommended for the administration of these products. However, this does not exclude the risk of complication occurrence such as extravasation of cytotoxic drugs. Passage in extravascular areas of chemotherapy drugs is a relatively less frequent incident but may lead to injury up to the extensive tissue necrosis that can worsen the patient's prognosis and alter his functional life comfort. Although this complication is very well known and widely described in literature, very few cases have been reported hence the interest of this case report.

Keywords Skin necrosis; Drug's extravasation; Complication of chemotherapy

Introduction

The number and diversity of antimitotic treatments have continued to increase in recent years so much that [1] it has changed the prognosis of malignant diseases and has led in some cases to complete remissions [1,2]. However, many side effects associated with the toxicity of these substances are well known. Besides, the administration of these toxics for long periods, leading to repeated access to the venous system, require the use of specific devices such as implantable central venous access port (IVAP) in order to minimize complications specifically related to the mode and route of administration of these drugs. Despite all these precautions, the patient is exposed to some complications like extravasations of the drugs administered. Extravasation of chemotherapy drugs causes variable effects depending on the type of substance extravasated. The degree of damage of affected tissue may range from mild skin reaction to the extended necrosis [2-4]. Even though the latter is well described, very few clinical cases have been reported.

In this article, we report a case of an extended necrosis of the soft tissues of the inner surface of the arm following the chemotherapy drug extravasation.

Clinical Observation

A 62 year old man, with no notable history, consults for extended necrosis of soft tissues of the inner part of the right arm. We point out through the examination that it is a right-handed patient monitored for squamous cell carcinoma of the larynx with mediastinal lymphadenopathy and pulmonary metastases. He underwent chemotherapy based (ERBITUX, CISPLATIN, TAXOTERE), which is administered through an implantable central venous port introduced at the sub clavian vein. At the waning of one of chemotherapy session, the patient presented a painful diffuse edema of the entire right forelimb. A Doppler ultrasound performed urgently eliminated a

thrombophlebitis by finding veins of the right forelimb that are permeables with compressible radial, ulnar and humeral veins. It allows the diagnosis of diffuse edema of the arm and right upper member. Through correlation with the clinical context, we point out an extravasation of chemotherapy drugs.

The patient would have benefited from drainage by iterative puncture. The evolution was marked by the occurrence of extended necrosis of the soft tissues of the entire inner areas of the right arm. The patient was then sent to us for care. Clinical examination at the admission, revealed a tracheotomised patient with an acceptable condition, (can communicate only by writing) not feverish. Locally edema of the right upper extremity with a necrotic closet extended to the entire inner part of the arm extending into the medial elbow (Figure1).



Figure 1: Extended necrosis of inner part of the right arm.

Associated to that, a flexion stiffness of the elbow with a limitation of 90° flexion and extension limitation. There is also a limitation of the bending of the fingers. The patient had a necrosectomy. Necrosis was

extended towards muscles lodge with purulent secretions that we collected for bacteriological examination. The cytobacteriological examination was used to isolate *Escherichia coli* multi-resistant package including a resistance to Amoxicillin+Clavulanic acid combination, sensitive only to colistin and methicillin sensitive *Staphylococcus aureus*. He was left to antibiotics initially introduced which is Amoxicillin+Clavulanic acid despite the results of susceptibility testing. The defect (Figure 2) was left with scarring led local care associated with kinesiotherapy.



Figure 2: Aspect after necrosectomy.

The outcome was favorable. A épidermo-dermal skin graft was performed after fifteen days, which has resulted in complete healing (Figure 2 and 3). At the end of the care, the stiffness of the elbow lingered, but we noticed an improvement in finger mobility which allows the patient to communicate (by writing)



Figure 3: Aspect after skin grafting.

Discussion

An increasing use of antimitotic substances with variable toxicity in medical oncology has ultimately led to an improvement of patient's prognosis [1,2]. However, the handling of these drugs, exposed to many complications that must be known by the practitioner. These

complications are multiple and multifactorial. Indeed, the complications of chemotherapy stem from the toxicity of the drugs used with an increased risk for poly chemotherapy [1] and complications of modes and routes of administration of these substances. To minimize the risks associated to latter, because of the toxicity of the drugs administered and the long duration of treatment requiring repeated access to the venous system, the use of implantable venous access port (IVAP) is recommended for the administration of these products. The IVAP are venous access port for long periods under the skin [5]. They were introduced fifty years ago [6] and have quickly emerged as an essential tool in the management of patients requiring iterative processing. In chemotherapy, the administration of cytotoxic drugs is the most common indication [5-7]. However, even the use of the IVAP is not without complications. They are rare but can be very serious. Among these complications, are infectious complications, the break of catheters, thrombotic syndromes, obstruction and extravasation of the drugs just to name a few. Venous thrombosis are the classic complications of deep long-term venous access [6]. Some factors increase significantly the risk of occurrence of these thromboses. These are: the presence of cervical or mediastinal lymphnode, tumormechanisms responsible for hypercoagulability, too short catheter and trauma to the venous endothelium during installation or endothelium aggression by nutrition fluids or chemotherapy like Taxotere, 5FU ect.

Sometimes the incision is involved. To this end, the jugular way would be the less thrombogenic one. Venous thrombosis is suspected when the following are present: pain, edema and diffuse impasto of the member [5,6]. This explains why thrombosis was mentioned at the beginning of symptoms in our patient's case; there were some promoting factors such as (the presence of mediastinal lymphadenopathy, IVAP implanted at the subclavian vein, and the administration of Taxotere). This justifies the realization of the venous echo Doppler of the thoracic member, which averted this diagnosis. Indeed, the Doppler venography and digital angiography examinations are part of examinations that confirm or invalidate the diagnosis of venous thrombosis [5,6].

Extravasation is defined as the accidental leakage of liquid from a blood vessel in the subcutaneous space or perivascular tissues [2]. Extravascular areas passage of these toxic drugs is an uncommon event (incidence is 0.26% or 0.022 episode for 1000 days of use) [7,8] but deserves to be highlighted by their potential severity. The soft tissue necrosis secondary to extravasation of cytotoxic drugs is a serious and debilitating complication for the patient [2,6] some effects may remain moderate. Indeed the degree of injury of the affected tissues depends on the extravasated substance's toxicity [2-6]. These drugs are classified into three groups according to their toxicity: Vesicant, may cause severe necrosis when they are injected outside the vein. Irritant drugs, responsible for irritation or inflammation without necrosis and non-irritating drugs that hardly produce reaction [2-6]. In the case of our patient, the protocol included two vesicant products (Taxotere, cisplatin) which would explain the evolution towards necrosis in this context. In case of extravasation of toxic drugs, most authors recommend subcutaneous aspiration and washing [2-9].

In any case, the protocols dictating appropriate conduct in case of drug extravasation according to the specific type of toxics exist and must be known by all personnel of this type of therapy. It is also important to note as stated by some authors [2,3] that the extravasation often follows an error or a lack of vigilance when administering the product. This emphasizes the responsibility of the

nursing staff in the occurrence of such incidents which can have dramatic consequences on the patient.

According to soft tissue necrosis management, the first step is debridement. This debridement may be biological, chemical or surgical. Surgical debridement shortens the development time.

This debridement should allow the removal of all necrotic tissue. Purulent secretions indicate the presence of germs at the boundary between the dead and the living. [10] This refers to bacteriocycle phenomenon as described by Raymond Vilain. This is the succession of different types of germ, real "garbage" activating for the separation "of dead from living". In this context, since they are not virulent that means they do not cause, on a broader view, bacteremia with fever and shivering and in a more specific way lack of wound healing, they are considered as actors of what can be called "normal infection" useful for biological debridement of all necrosis [10,11]. In this case, only local care is enough to ensure a good outcome after effective debridement. This justifies our attitude in order not to change antibiotic therapy in the absence of general and local signs of overt infection.

The kinesiotherapy had an important place in the treatment of this patient. In this case of tracheotomised patient who can communicate only by writing and whose dominant member is affected, the non-recovery of function of the fingers could be experienced dramatically by the patient.

Conclusion

The use of cytotoxic drugs in medical oncology in order to improve the prognosis of patients with malignant diseases is not without risk. The contribution of the plastic surgeon in the management of these complications is important on one hand, through its emergency intervention that can limit tissue damage on the other hand the treatment of residual loss substances the coverage of which requires a simple graft, local flaps and sometimes free flaps.

It is important that the healthcare professional remains aware of these risks and take the necessary precautions to minimize these

complications which can book the functional prognosis and alter the patient's comfortable life.

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