CASE REPORT

Massive breast necrosis after extravasation of a full anthracycline cycle

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SUMMARY

A 57-year-old woman with invasive breast cancer was referred for adjuvant chemotherapy after undergoing breast conservative therapy and axillary dissection. A port was inserted in the contralateral subclavian vein and epirubicin, cyclophosphamide and 5-fluorouracil was the treatment of choice. After the first cycle, the patient was sent home. The following day, she reported rapidly developing redness and pain in the right breast and diagnosis of epirubicin extravasation was made. She was hospitalised, the port was surgically removed and approximately two-thirds of the breast underwent tissue necrosis. The necrotic tissue was resected and a skin graft was harvested from the thigh. She was offered DIEP-flap reconstruction 8 months later. There were no complications, except for marginal necrosis of the flap. Necrosectomy was performed and resolved through an advancement flap.

BACKGROUND

We want to remind the importance of ensuring port or peripheral catheter patency and position before starting anthracycline treatment, as prevention of anthracycline extravasation remains the best treatment.

CASE PRESENTATION

A 57-year-old woman with invasive breast cancer (stage pT2, pN1a, L1, R0, G2, M0; receptor status ER+, RP+, HER-2-) was referred for adjuvant chemotherapy after undergoing breast conservative therapy and axillary dissection. A port was inserted in the contralateral (right) subclavian vein prior to adjuvant treatment. Intraoperative fluoroscopic imaging control was performed to ensure correct port placement and exclude the presence of a pneumothorax. The patient was given epirubicin along with cyclophosphamide and 5-fluorouracil, according to current standards. After completion of the first cycle, the patient was sent home. The following day, the patient reported rapidly developing redness and pain in the right breast. The region surrounding the port and enveloping half of the breast was erythematous, oedematous and painful, and diagnosis of epirubicin extravasation was made.

TREATMENT

As more than 24 h had elapsed, the patient was not eligible for treatment with dexrazoxane, which requires administration within 6 h of extravasation. The patient was hospitalised and the port was surgically removed, showing proper placement and no

signs of leakage. She was given antibiotherapy with cefuroxim and cephalexin for 10 days as well as pain management therapy. The skin started to necrose and expectant treatment was opted for. After 32 days, approximately two-thirds of the breast had undergone tissue necrosis (figure 1) and surgical revision of the wound was decided. The necrotic tissue was resected to the underlying musculature (figure 2), and a skin graft was harvested from the thigh. The graft healed without complications and the patient was offered breast reconstruction 8 months later. The skin graft was removed and deep inferior epigastric perforators (DIEP)-flap was performed. There were no postoperative complications, except for lateral marginal necrosis of the flap. Necrosectomy was performed and the resulting defect was resolved through an advancement flap of the lateral thorax wall (figure 3).

OUTCOME AND FOLLOW-UP

Surgical debridement and skin grafting with delayed DIEP-flap reconstruction achieved a very satisfactory cosmetic result. However, prevention remains the best treatment, as it is both fast and simple.

DISCUSSION

Accidental extravasation of anthracycline agents is estimated to occur in 0.1–6% of patients receiving chemotherapy treatment.¹ Treatment of extravasation depends on the quantity extravasated, the delay until therapy is started and the size of the resulting necrotic injury. Historically, a number of local treatments have been used, such as dimethyl sulfoxide (DMSO),² cooling and intralesional injection of corticosteroids⁴—with either no proven benefit or even detrimental effect. Anthracyclines are topoisomerase poisons that can be antagonised with the topoisomerase II inhibitor dexrazoxane, which inhibits typical cardiotoxicity.⁵ Two prospective multicenter clinical studies showed that timely treatment prevented surgery in 98.2% of patients.⁶ However, intravenous infusion must be given within 6 h of extravasation. Usually, patients react to paravasal infusion of anthracyclines with excruciating pain and/or extravasation is recognised by the care-giving nurse. However, if the condition is missed, the consequences may be dramatic, with massive necrosis and ensuing tissue destruction.

In summary, we describe extravasation of a full cycle of epirubicin that went unrecognised by both the patient and the caregiver, resulting in the loss of a majority of the breast tissue. In a previous report, half-cycle epirubicin extravasation was

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Figure 1 Tissue necrosis approximately 1 month after port extravasation of a full cycle of epirubicin.

Figure 3 Delayed reconstruction through deep inferior epigastric perforators-flap and necrosectomy with advancement flap of the lateral thorax wall.

successfully treated by dexrazoxane infusion within 1 h and granulocyte macrophage colony stimulating factor injection of the ulcerated skin.⁷ However, our case involved double the quantity of extravasate with delayed recognition, leading to necrosis of approximately two-thirds of the breast. Subsequent surgical debridement and skin grafting with delayed DIEP-flap reconstruction achieved a very satisfactory cosmetic result (figure 3). It is important to emphasise a multidisciplinary approach and surgical expertise as the keys to successful remedial treatment in such a dramatic case. However, prevention remains the best approach and is both fast and simple.

With this case, we want to remind caregivers of the importance of checking correct port or peripheral catheter patency and position by means of brief aspiration of blood prior to administering treatment, followed by flushing with sodium chloride or glucose solution. All departments where cytotoxic agents are given should have written guidelines on their handling and established procedures in case of extravasation. Persons responsible for administering cytotoxic drugs should be aware of the potential effects of extravasation and trained in appropriate remedial procedures for such eventuality.¹

Figure 2 Surgical debridement of necrotic tissue.

Learning points

- ▶ Always ensure port or peripheral catheter patency and position before starting anthracycline treatments.
- ▶ Anthracyclines should be administered as a short infusion only in the presence of healthcare professionals with oncological training.
- ▶ The patient should be informed of alarming symptoms such as pressure or burning sensation at the infusion site.
- ▶ In all departments where cytotoxic agents are given, written guidelines for handling cytotoxic agents and procedures in case of extravasation should be present. The persons responsible for administering cytotoxic drugs should be informed and educated about the drugs and the problems they may cause in case of extravasation and the procedures to follow if this happens.
- ▶ An imaging procedure to ensure proper port placement and to exclude a possible pneumothorax should always be performed, either intraoperatively or as a follow-up.

Contributors WS was involved in treatment of the patient. IV was involved in writing the case report and WS contributed by reviewing and revising the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Commissioned; internally peer reviewed.

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