

Extravasation of Yttrium-90 Ibritumomab Tiuxetan: A Case Study

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Ibritumomab tiuxetan is a radiolabeled monoclonal antibody that targets B-cell non-Hodgkin lymphoma tumor cells. Yttrium-90 (Y-90), the radioisotope used to deliver the therapy, may act as a vesicant, potentially causing severe tissue damage if extravasation occurs. Particularly important to nurses is that Y-90 may not show signs or symptoms of extravasation until weeks or months after the IV injection. A case study of a man with B-cell non-Hodgkin lymphoma presented in this article shows the progression of the extravasation and steps taken to treat and eventually heal the extravasation site. Included is information about ibritumomab tiuxetan treatment, administration, eligibility criteria, and guideline recommendations for extravasation.

Despite the increased use of ibritumomab tiuxetan (Zevalin®, Cell Therapeutics Inc.) radioimmunotherapy for B-cell lymphoma, little is offered in the research literature regarding extravasation of yttrium-90 (Y-90), including minimal guidance on how to care for a patient when extravasation occurs. However, oncology nurses should be aware that extravasation reactions may not show any initial signs or symptoms, leaving nurses and patients unaware of future difficulties.

Radioimmunotherapy is an oncology treatment that administers radioisotopes and targeted monoclonal antibodies to antigens on specific tumor cells (Hendrix, de Leon, & Dillman, 2002). Ibritumomab tiuxetan, a type of radioimmunotherapy, is a monoclonal antibody that may be used after failure of standard chemotherapeutic regimens such as CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) or rituximab (Rituxan®, Biogen Idec) for specific types of non-Hodgkin lymphoma. Ibritumomab tiuxetan is useful in treating relapsed or refractory low-grade, follicular, or transformed B-cell non-Hodgkin lymphoma (Biogen Idec, 2005).

Ibritumomab tiuxetan has a complex delivery process that targets B-cell non-Hodgkin lymphoma tumor cells. Hamsters given B-cell non-Hodgkin lymphoma produce antibodies which are collected for use in human B-cell non-Hodgkin lymphoma (Biogen Idec, 2005). The monoclonal antibody and the Y-90 radioactive isotope are held together by tiuxetan (Clayton, 2003). The combination targets and attaches itself to the CD20 receptor on the B-lymphocyte cell. This enhances the radiation dose directly delivered to the B-cell non-Hodgkin lymphoma tumor (see Figure 1). Y-90 is used because treatment remains localized with a minimal dose absorbed by surrounding tissue.

At a Glance

- ◆ Ibritumomab tiuxetan is useful for treating relapsed or refractory low-grade, follicular, or transformed B-cell non-Hodgkin lymphoma.
- ◆ Tissue may be severely damaged if extravasation occurs from yttrium-90 (Y-90) treatment.
- ◆ The half-life of Y-90 is 64.1 hours; therefore, the dose will be half as strong at that point and one-fourth as strong after 128.2 hours.

Initial evaluations of patients targeted to receive ibritumomab tiuxetan involve pathology reports on the B-cell non-Hodgkin lymphoma and examination of lymphoma masses through radiographic studies. Patient history, including previous chemotherapeutic regimens and adverse reactions to rituximab—to diagnose possible anaphylactic shock—should be obtained. Patients should have platelet counts greater than 100,000 cells/ml, neutrophil counts greater than 1,500 cells/ml, and a recent bone

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