

Assessing the Risk of Hemorrhagic Complication following Transjugular Liver Biopsy in Bone Marrow Transplantation Recipients

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ABSTRACT

Purpose: To determine if recipients of bone marrow transplants (BMTs) are at increased risk of hemorrhagic complications following transjugular liver biopsy (TJLB).

Materials and Methods: TJLBs in BMT and non-BMT patients between January 2007 and July 2014 were reviewed. Patient demographic and pre- and postprocedural laboratory data were reviewed. Mean platelet count and International Normalized Ratio were $174,300 \times 10^3/\mu\text{L} \pm 107.3$ (standard deviation) and 1.2 ± 0.4 , respectively, for BMT recipients, compared with $88,100 \times 10^3/\mu\text{L} \pm 70.9$ and 1.2 ± 0.5 , respectively, for non-BMT. Patients in whom hemoglobin level decreased by $> 1 \text{ g/dL}$ and/or required transfusion within 15 days of TJLB were reviewed to determine the presence of a biopsy-related hemorrhagic complication.

Results: A total of 1,600 TJLBs in 1,120 patients were analyzed. Of these, 183 TJLBs in 159 BMT recipients and 1,417 TJLBs in 961 patients non-BMT patients were performed. Thirteen TJLBs were complicated by hemorrhage: five in BMT (2.9%) and eight in the non-BMT cohorts (0.6%; $P < .01$). Preprocedural platelet counts were within normal range ($57\text{--}268 \times 10^3/\mu\text{L}$) in all but one patient ($8 \times 10^3/\mu\text{L}$). BMT recipients had an odds ratio of 4.9 (95% confidence interval, 1.25–17.3) for post-TJLB bleeding/hemorrhage compared with those without BMTs ($P < .01$).

Conclusions: TJLB continues to be a safe procedure in the vast majority of patients. However, hemorrhagic complications occurred at a rate of 2.9% in BMT recipients, compared with 0.6% in patients without BMTs, and therefore caution should be exercised when performing TJLB in this group.

ABBREVIATIONS

BMT = bone marrow transplant, INR = International Normalized Ratio, SD = standard deviation, TJLB = transjugular liver biopsy

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Transjugular liver biopsy (TJLB) is an established technique by which hepatic tissue is sampled in populations at high risk for complications. Typical indications for this approach include preexisting coagulopathy, ascites, obesity, transplantation, and cirrhosis (1). The procedure is well-tolerated, with major hemorrhagic complications being exceedingly rare, occurring at rates as high as 0.87% (1,2).

In patients who have received allogenic bone marrow transplants (BMTs), associated liver disease, particularly venoocclusive disease, graft-versus-host disease, malignancy, and/or opportunistic infections, are sources of morbidity and mortality. In this setting, a liver biopsy is often indicated to establish diagnosis and determine prognosis. Accompanying contraindications and/or the need to assess the portosystemic gradient generally dictate the use of TJLB as opposed to the percutaneous approach in this population. However, a small body of literature reports a higher-than-expected incidence

of hemorrhagic complications, ranging from 1% in some studies to as high as 30% in others (3–5), with the discrepancy likely related to the technique and type of biopsy used. A recent series of TJLB in a large population of BMT recipients (6) reported a 1.6% risk of hemorrhagic complications and concluded TJLB to be relatively safe and to provide important diagnostic information necessary for clinical decision-making.

With the incidence of bone marrow transplantation expected to continue its increase during the next several years, it remains imperative to further clarify the safety of performing TJLB in this patient population (7). The purpose of the present study was to investigate the incidence of major, clinically evident hemorrhage following a TJLB in BMT recipients compared with patients who have not received a BMT.

MATERIALS AND METHODS

The present study is a single-institution retrospective study that was Health Insurance Portability and Accountability Act-compliant and performed with institutional review board approval.

Patient Selection

Between May 2007 and July 2014, the Radiology Information System was used to identify patients with a listed procedural code of TJLB with or without hemodynamic analyses (Fig 1), returning a total of 1,814 procedures to our query. Exclusion criteria included miscoded TJLB in the Radiology Information System (ie, patients actually underwent percutaneous liver biopsy), TJLB as a part of a more complex procedure, aborted TJLB as a result of technical difficulties (ie, occluded jugular vein, inability to cannulate hepatic vein), inability to retrieve pre- or postprocedural laboratory data (ie, platelet count), and loss to follow-up.

The final study population consisted of 1,600 biopsies in 1,120 patients: 183 who had received a BMT and 1,417 who had not. Of these, 719 biopsies were performed on patients admitted to the hospital, whereas the remaining 881 TJLBs were performed as outpatient procedures. In the latter group, follow-up clinic notes were available on all patients, and subsequent laboratory data were available following 536 of these 881 TJLBs in outpatients (60.8%).

The main indications for a TJLB at our institution were a contraindication to percutaneous liver biopsy, such as history of coagulopathy, ascites, acute liver

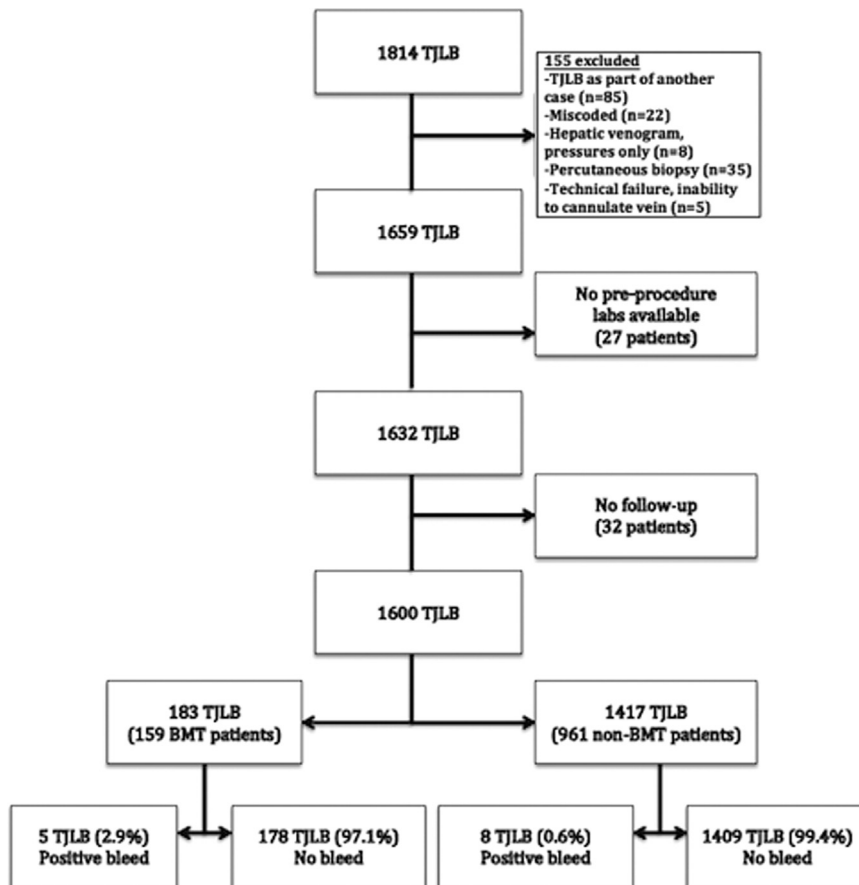


Figure 1. Flow diagram demonstrating the studied population with exclusion criteria applied.

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