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Dental extraction is probably safe for patients with thrombocytopenia: the standard of care is a guide for clinical decision making related to platelet transfusion

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ABSTRACT A critical appraisal and clinical application of Fillmore WJ, Leavitt BD, Arce K. Dental extraction in the thrombocytopenic patient is safe and complications are easily managed. *J Oral Maxillofac Surg.* 2013 Oct;71(10):1647-1652. doi:[10.1016/j.joms.2013.05.011](https://doi.org/10.1016/j.joms.2013.05.011).

Keywords: Dental procedures, Thrombocytopenia

Clinical Context

A 62 year old African American male with a history of myelodysplastic syndrome has had frequent visits to the hospital for neutropenic fever, anemia, and thrombocytopenia. During this particular stay he reported a new complaint regarding a traumatic lesion on his right buccal mucosa. A dental consult was placed to rule it out as a source of infection. The dental team found no evidence of active oral infection, but felt that his poor dentition represented a potential source of future infection. Although he was thrombocytopenic (platelet count of 26,000/ μ l), 7 teeth were removed. Directly following the procedure, gauze was placed at the surgical site and pressure was maintained by the patient. Several hours after the procedure, the patient continued to have mild active bleeding and developed significant swelling over the next 24 hours. The bleeding was controlled over the next several days by repeated gauze replacements and pressure.

Clinical Question

Is dental extraction in patients with thrombocytopenia safe?

Research Article

Fillmore WJ, Leavitt BD, Arce K. Dental extraction in the thrombocytopenic patient is safe and complications are easily managed. *J Oral Maxillofac Surg.* 2013 Oct;71(10):1647-1652. doi:[10.1016/j.joms.2013.05.011](https://doi.org/10.1016/j.joms.2013.05.011).

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Literature Review

A literature review via PubMed revealed little data addressing this topic. The few papers that discuss patients with thrombocytopenia requiring dental procedures show that excessive bleeding and complications are rare.¹⁻²

One small study ($n=14$) published in 2012 focused on patients with thrombocytopenia secondary to Gaucher disease and found that with appropriate use of prophylactic platelet transfusion, Desmopressin Acetate (DDAVP) preoperatively and tranexamic acid, there were no cases of excess bleeding.¹

Another 2015 study of 24 patients with immune thrombocytopenia showed no bleeding complications as long as severely thrombocytopenic patients were given supplemental platelet transfusion preoperatively.²

The most relevant article has been chosen for critical appraisal. The 2013 Mayo Clinic study explicitly addresses safety and complications of tooth extraction in thrombocytopenic patients without a focus on a particular disease.

Critical Appraisal

This archival cohort study had a larger sample size ($N=68$) and was more relevant to the clinical question than other papers, making this study's results more applicable to the clinical case. In terms of methodology, the study benefits from clear definitions for thrombocytopenia and postoperative complications. There are clear inclusion and exclusion criteria, and an appropriate follow-up period (fifty days after surgery) was included, with details for two patients who died of their underlying disease. The authors also detail the intraoperative hemostasis procedures in order to ensure that the patients are comparable.

However, the methodology of the study created a major limitation in answering whether dental extraction is safe in severely thrombocytopenic patients. Although authors collected platelet counts before the procedure as a predictor variable for postoperative bleeding, all patients with severe thrombocytopenia ($<50,000$ platelets/ μl) were given platelet transfusions per institution protocol pre- or intraoperatively. Therefore, patients with reported counts under $50,000$ platelets/ μl (32/68) were likely to have had much higher actual platelet counts during the procedure. Despite this, initial platelet counts did predict perioperative bleeding on bivariate analysis. The study does mention this as a major limitation and notes that there no quality data exists concerning the complication rate of those undergoing teeth extraction with under $50,000$ platelets/ μl .

To explain institutional protocol, and support its recommendations, the study cites basic surgical texts and literature that make two recommendations: 1) a count of $30,000$ - $50,000$ platelets/ μl for minor procedures and $100,000$ platelets/ μl for major procedures, and 2) transfusion of platelets preoperatively or intraoperatively (as opposed to post-operatively).³⁻⁴

Ultimately, the paper recognizes the need for a more thorough prospective study. However, it also concludes that using the author's methods, postoperative bleeding with thrombocytopenic patients was infrequent (5/68). The bleeding that did occur was easily controlled through local hemostatic measures such as gauze and pressure (3/5), or aminocaproic acid rinse (2/5).

As an individual cohort study, this paper would fall into the 2b level of evidence according to the Oxford Centre for Evidence-based Medicine. However, it should be noted that the paper lacks a control group which makes calculating a number needed to treat impossible. Therefore, the results are more similar to a case series, or a poor quality cohort study, making it a level 4 study. Still, there are no superior studies on the subject and this paper provides a starting point from which to pursue prospective studies in the future.

Clinical Application

There is little literature on the safety of dental extraction in thrombocytopenic patients. This study provides some evidence that dental extraction can be performed safely in patients with thrombocytopenia. Given the relatively poor quality of evidence, it seems reasonable to use similar institutional policies regarding platelet transfusion for patients with $<50,000$ platelets/ μl . Additionally, it suggests that complications that occur are easily managed with local measures.



In this clinical context, the 7 teeth were removed without platelet transfusion, despite a very low platelet count of 26,000 platelets/ μl . While some study subjects had similar initial levels of platelets, they were transfused pre or intraoperatively. In this case, the patient was evaluated by the dental team who proceeded with the extraction without transfusion. It is unclear whether the team was unaware of the low platelet level or made the decision to go ahead with the procedure anyway. In either case, post-operative bleeding was easily managed and represents a comparable result to the 5 patients who had complications in the study. In that regard, this clinical case obtains the status of a case report itself—safety of dental extraction in a patient with a platelet count <50,000 platelets/ μl .

There is no direct evidence that pre or intraoperative platelet transfusion would have resulted in less bleeding in this particular patient.

The lessons learned are as follows: 1) Dental extraction is safe in thrombocytopenic patients with greater than 50,000 platelets/ μl . Bleeding complications are easily managed with local measures. 2) Because there is little evidence to support the safety of dental procedures for severely thrombocytopenic patients with less than 50,000 platelets/ μl , physicians and their patients should consider platelet transfusions to reach 50,000 platelets/ μl for dental extractions. This patient may have benefitted from platelet transfusion by having less bleeding that required local care. However, the risk of bleeding must be weighed against the potential complication of platelet transfusion.

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