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ORIGINAL ARTICLE

ANALYSIS OF COMPLICATIONS IN ORAL SURGICAL PROCEDURES IN LIVER TRANSPLANT PATIENT: A CLINICAL STUDY

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ABSTRACT:
Back Ground: The aim of this prospective study was to evaluate the incidence of postoperative bleeding after dental extraction in candidates for liver transplantation. **Material & Methods:** 252 liver transplanted patients were included in this study. Patients were included in the analysis when the blood examinations showed a platelet count of 30,000/mm3 or greater and an international normalized ratio (INR) of 3.0 or less. In group 1 local pressure was applied by use of gauze soaked with tranexamic acid, and in group 2 gauze without tranexamic acid was used. Absorbable hemostatic sponges and cross sutures were used as a standard hemostatic measure. **Results:** In the 252 patients included in this study, 148 simple extractions were performed during 105 dental surgical procedures. The main preoperative blood tests such as hematocrit level, platelet counts and a mean INR were calculated. Postoperative bleeding occurred during only 1 procedure (2.8%), and local pressure with gauze was effective for achieving hemostasis. No statistically significant difference in the time to hemostasis was found between the 2 groups. **Conclusions:** This study found a low risk of bleeding for tooth extractions in patients with liver cirrhosis, INRs of 2.50 or less, and platelet counts of 30,000/mm3 or greater. Blood transfusions were not needed, and in the case of postoperative bleeding, the use of local hemostatic measures was satisfactory.
Key words: Liver transplantation, heamostasis, tranexamic acid.

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INTRODUCTION

Liver transplant is the gold standard therapy for patients with end-stage liver disease, also known as cirrhosis. Chronic hepatitis C and alcohol-induced liver disease are the 2 main causes of cirrhosis in candidates for orthotopic liver transplantation.1 According to the Global Observatory on Organ Donation and Transplantation, the liver is the second most transplanted organ, with 20,300 liver transplants performed worldwide in 2008.2

Infection and rejection are the most common postoperative transplant complications and give the greatest cause for concern. For this reason, medical evaluation and treatment of the foci of infection before organ transplantation are recommended.

Despite the discussions in the literature about the role of oral infections in post-transplant complications, dental treatment for oral foci before transplantation is a good practice for providing oral health to patients receiving immunosuppressive therapy after organ transplants.4

Niederhagen et al5 and Rustemeyer and Bremerich3 reported incidences of 65% and 68.4%, respectively, in patients with liver disease requiring dental surgical intervention for oral foci sanitation. Postoperative bleeding is main complication in patients with liver transplantation. Hence more efforts should be done to minimize this complication. The present study focuses on the postoperative complication in liver transplanted patients requiring extractions.

MATERIAL & METHODS

This study was conducted in Oral and maxillofacial department on those patients who had received Liver Transplantation during 2010–2015 and who had had a dental examination during evaluation process. The study population consisted of 252 patients, 140 men and 112 women. The patients' medications, other systemic diseases such as diabetes and dialysis treatment, as well as oral health data at the time of listing, were recorded from the medical and dental files.

The hard and soft oral tissues are being examined and signs of oral infections are recorded. Panoramic radiographs and IOPAR of the patients were taken to help clinical diagnosis. Infectious dental foci include 1. Apical periodontitis (apical radiolucencies) as seen in the x-rays 2. Chronic periodontitis which is recorded as ‡6 mm periodontal pocket depths and severe alveolar bone tooth attachment loss non-vital teeth with deep caries cavities, 3. Root remnants and partially erupted wisdom teeth with pericoronitis. Mucosal pathologies including e.g. aphtous lesions, stomatitis, oral candidiasis, or leukoplakias are also recorded. Furthermore, possible temporomandibular disorders such as clicking of the joint, restrictions of the mouth opening, or radiological findings of arthrosis are recorded.

Blood samples for the study purpose were collected within 24 hours before tooth extraction. Patients were included in the analysis if their blood examinations showed a platelet count of 30,000/mm3 or greater and an INR of 3.0 or less. In this study all tooth extractions were performed without the administration of blood products (platelet concentrate, freshfrozen plasma). Antibiotic prophylaxis was prescribed in patients at risk for spontaneous bacterial peritonitis, ascites, or neutropenia absolute neutrophil count- 1,500/mm3. The protocol was prescribed: 2 g of amoxicillin in addition to 500 mg of metronidazole 1 hour before the procedure. Patients scheduled for dental extraction were randomly divided into 2 groups: in group 1 local pressure was applied after sutures by use of gauze soaked with tranexamic acid at 250 mg per 5 mL, and in group 2 (control) local pressure with gauze without tranexamic acid was used. Local pressure was continuously applied for 5 minutes and repeated until hemostasis was achieved. In both groups standard procedures were performed with the use of absorbable hemostatic sponges introduced into the tooth socket until it was completely filled and a No. 3-0 silk cross suture to keep the sponge in place. Extractions were performed with patients under local anesthesia via 2% mepivacaine with 1:100,000 epinephrine. No more than 3 cartridges (5.4 mL) were used during each procedure. The patients were classified into different groups based on the following type of Chronic Liver Disease: primary sclerosing cholangitis (PSC), primary biliary cirrhosis (PBC), alcohol cirrhosis (ALCI), cryptogenic cirrhosis (CRYPT), other cirrhosis (OTCI; including autoimmune cirrhosis and viral hepatitis), malignant primary liver tumours (MALIGN) and other liver diseases.

RESULTS:

Table I: Distribution of Patients

PSC	PBC	ALCI	CRYPT	OTCI	MALIGN	OTHER
64	40	42	18	38	28	22

Table II: Distribution of patients based on dental diseases

APICAL PERIODONTITIS	CHRONIC PERIODONTITIS	ROOT RAMNENTS	MUCOSAL LESIONS	TMJ DISORDERS	OTHERS
64	44	36	46	37	25

Table III: Number of procedures and extraction in groups

	PATIENTS	GROUP I	GROUP II
NO. OF PROCEDURES	105	55	50
NO. OF EXTRACTION	148	98	50

Table IV: Blood indices in both groups

		PATIENTS	GROUP I	GROUP II	P VALUE
Haemocritic level	Mean±S.D	105	42.15±5.02	40.05±4.05	<0.01
Platelet count	Mean±S.D	70.2±2.3	88±4.5	68.7±2.5	0.5
INR	Mean±S.D	1.66±2.3	1.60±2.3	1.79±2.4	0.4
PTT RATIO	Mean±S.D	2.44±0.5	2.40±2.4	2.30±3.4	0.3

Table I shows distribution of patients. 64 were of PSC, 40 PBC, 42 ALCI, 18 OTCI, 28 malignant and 22 others.

Table II shows distribution of patients depending upon dental diseases. 64 were of apical periodontitis, 44 chronic periodontitis, 36 root remnants, 46 mucosal lesions, 37 TMJ disorders and others 25.

Table III shows procedure done on 105 patients and extractions done. In group I 55 procedures were done, in group II 50 procedures were done. 98 extractions were done in group I while 50 in group II.

Table IV shows blood indices in both groups. Heamocratic value, platelet count, INR and PTT ratio is shown in table.

DISCUSSION

This study was conducted in in Oral and maxillofacial department on those patients who had received Liver Transplantation during 2010–2015 and who had had a dental examination during evaluation process. The study population consisted of 252 patients, 140 men and 112 women.

Total patients were 252. 64 were of PSC, 40 PBC, 42 ALCI, 18 OTCI, 28 malignant and 22 others. 64 patients showed apical periodontitis, 44 chronic periodontitis, 36 root remnants, 46 mucosal lesions, 37 TMJ disorders and others 25. In our study out of 252 patients, dental procedures were done in 105 patients and total of 148 extractions were done. In group I 55 procedures were done, in group II 50 procedures were done. 98 extractions were done in group I while 50 in group II.

In the literature, there are a wide variety of studies that have assessed the risk of bleeding in oral anticoagulated patients, including some recent meta-analytic studies.22,23 However, studies with those types of patients do not provide reliable comparisons for understanding the risk of bleeding in liver disease patients. The difference is that in patients with liver disease, the impairment in hemostasis may be a reflection of anemia, decreased production of clotting factor because of hepatic synthetic dysfunction, depletion of vitamin K stores because of malnutrition or decreased intestinal absorption, increased fibrinolytic activity, and/or thrombocytopenia because of portal hypertension–induced splenic sequestration or alcohol- induced bone marrow suppression.9,24 In this way, the complexity of hemostasis impairment in these patients is higher than that in anticoagulated patients. However, to date, studies using a model with anticoagulated patients have become more frequent in the literature, and this is the closest model of hemostasis impairment that can be compared with patients with liver disease. In anticoagulated patients,

local hemostatic measures have been proven to be effective in patients with an INR of 4.0 or less. In studies with these patients, the few episodes of bleeding have been related to teeth with soft tissue inflammation and periodontal disease, and local hemostatic measures were effective in stopping the bleeding without the need for hospital admission or the administration of blood components.

Further studies with liver transplant patients should be encouraged to help the practitioner understand the limits of surgical dental care intervention without the administration of blood components and without increasing the risk of postoperative bleeding. However, these procedures are recommended in outpatient settings only if a medical on-call service is available to perform emergency hemostatic measures or hospital admission for blood transfusion if needed.

CONCLUSION

This study showed the possibility of performing tooth extractions in patients with liver cirrhosis, with INRs of 2.50 or less and platelet counts of 30,000/ mm3 or greater, without the need for blood transfusion. In the case of bleeding, the use of local hemostatic measures was effective.

REFERENCES

1. Firriolo FJ: Dental management of patients with end-stage liver disease. Dent Clin North Am 50:563, 2006
2. Moia M, Mannucci PM, Vizzotto L, et al: Improvement in the haemostatic defect of uraemia after treatment with recombinant human erythropoietin. Lancet 1987;2:1227.
3. Rustemeyer J, Bremerich A: Necessity of surgical dental foci treatment prior to organ transplantation and heart valve replacement. Clin Oral Investig 2007;11:171.
4. Guggenheimer J, Eghtesad B, Stock DJ: Dental management of the (solid) organ transplant patient. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2003;95:383.
5. Niederhagen B, Wolff M, Appel T, et al: Location and sanitation of dental foci in liver transplantation. Transpl Int 2003;16:173.
6. Guggenheimer J, Mayher D, Eghtesad B: A survey of dental care protocols among US organ transplant centers. Clin Transplant 2005;19:15.
7. Shaqman M, Ioannidou E, Burleson J, et al: Periodontitis and inflammatory markers in transplant recipients. J Periodontol 2010;81:666.
8. O'Leary JG, Yachimski PS, Friedman LS: Surgery in the patient with liver disease. Clin Liver Dis 2009;13:211.
9. Tripodi A: Tests of coagulation in liver disease. Clin Liver Dis 2009;13:55.
10. Douglas LR, Douglass JB, Sieck JO, et al: Oral management of the patient with end-stage liver disease and the liver transplant patient. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;86:55.
11. Ward BB, Weideman EM: Long-term postoperative bleeding after dentoalveolar surgery in the pretransplant liver failure patient. J Oral Maxillofac Surg 2006;64:1469.
12. Ministério da Saúde: Projeto SB Brasil. Condições de Saúde Bucal da População Brasileira 2002-2003: Resultados Principais. Brasília, Ministério da Saúde, 2004. Available from:URL:http://bvsms.saude.gov.br/bvs/publicacoes/projeto_ sb2004.pdf. Accessed March 6, 2011
13. Anand A, Feffer SE: Hematocrit and bleeding time: An update. South Med J 1994;87:299.
14. Eugster M, Reinhart WH: The influence of the haematocrit on primary haemostasis in vitro. Thromb Haemost 2005;94:1213.
15. Quaknine-Orlando B, Samama CM, Riou B, et al: Role of the hematocrit in a rabbit model of arterial thrombosis and bleeding. Anesthesiology 1999;90:1454.
16. Valeri CR, Khuri S, Ragno G: Nonsurgical bleeding diathesis in anemic thrombocytopenic patients: Role of temperature, red blood cells, platelets, and plasma-clotting proteins. Transfusion 2007;47:206S.
17. Escolar G, Garrido M, Mazzara R, et al: Experimental basis for the use of red cell transfusion in the management of anemicthrombocytopenic patients. Transfusion 1988;28:406.

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