

Cangkok Tulang Gigi Anterior Maksila Pada Pasien Periodontitis Kronis Dengan Polisitemia Vera (Laporan Kasus)

Maxillary Anterior Dental Bone Graft In Chronic Periodontitis Patients With Polycythemia Vera (Case Report)

Muhammad Yusuf¹, Shinta Ferronika²

¹Program Specialist of Periodontics, Faculty of Dentistry, Gadjah Mada University

²Central General Hospital Periodontist Dr. Sarjito Yogyakarta

Correspondence email to: yusuf.drg@gmail.com

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ABSTRAK

Polisitemia vera merupakan kelainan mieloproliferatif yang ditandai dengan proliferasi mieloid dan menyebabkan peningkatan produksi eritrosit. Kondisi ini menjadi tantangan tersendiri bagi pasien periodontitis. Periodontitis yang disertai trauma oklusi dapat menyebabkan pengeroposan tulang, resesi dan mobilitas gigi. Laporan kasus ini bertujuan untuk mendeskripsikan penatalaksanaan pasien polisitemia vera dalam menjaga gigi dan memulihkan jaringan periodontal yang sehat dengan operasi flap dan pencangkokan tulang. Pasien laki-laki berusia 43 tahun dengan keluhan gigi depan atas goyang sejak beberapa tahun terakhir. Pemeriksaan klinis menunjukkan luksasi gigi derajat 2 disertai poket periodontal ± 6 mm. Pemeriksaan radiografi menunjukkan pengeroposan tulang vertikal pada daerah anterior rahang atas. Pasien telah menjalani perawatan awal berupa scaling, root planing, dan splinting dengan fiber komposit serta penyesuaian oklusal. Koordinasi dan evaluasi klinis pasien oleh ahli hemato-onkologi dalam persiapan operasi flap dengan aplikasi cangkok tulang. Pada kasus pengeroposan tulang vertikal disertai gigi goyang akibat trauma oklusi, diperlukan penanganan yang memadai. Operasi flap dilakukan untuk menghilangkan kantong dalam dan cangkok tulang untuk regenerasi tulang. Disimpulkan, upaya terkoordinasi dari ahli hemato-onkologi dan periodontis diperlukan untuk perawatan periodontal, khususnya terapi invasif. Prosedur bedah rekonstruktif dengan cangkok tulang pada kasus ini menunjukkan hasil yang cukup baik.

Kata Kunci: Polisitemia vera, bedah flap, cangkok tulang

ABSTRACT

Polycythemia vera is a myeloproliferative disorder characterized by myeloid proliferation and causes increased erythrocyte production. This condition is a challenge for patients with periodontitis. The periodontitis accompanied by occlusion trauma can cause bone loss, recession, and tooth mobility. This case report describes the management of a patient with polycythemia vera in preserving teeth and restoring healthy periodontal tissue with flap surgery and bone grafting. A 43-year-old male patient with complaints of loose upper front teeth for the past few years. Clinical examination indicated grade 2 tooth luxation, accompanied by a periodontal pocket of ± 6 mm. A radiographic examination showed vertical bone loss in the anterior region of the maxilla. The patient has undergone initial treatment in the form of scaling, root planing, and splinting with fiber composite, as well as occlusal adjustment. Coordination and clinical evaluation of the patient were carried out by a hemato-oncologist in preparation for flap surgery with bone graft application. In cases of vertical bone loss accompanied by loose teeth due to occlusion trauma, adequate treatment is needed. Flap surgery was performed to eliminate deep pockets and bone grafts for bone regeneration. In conclusion, coordinated efforts by of hemato-oncologists and periodontists are necessary for periodontal treatment, especially invasive therapy. In this case, the reconstructive surgical procedure with bone graft showed quite good results.

Keywords: Polycythemia vera, flap surgery, bone graft

INTRODUCTION

A myeloproliferative condition called polycythemia vera is characterized by myeloid proliferation and elevated erythrocyte production.^{1,2} Hemoglobin concentrations can range from 18 to 24 g/dl, and erythrocyte counts can reach 6 to 12 million/mm³. Thus, increasing blood viscosity can cause thrombosis.^{3,4}

Currently, the goal of treating polycythemia vera is to lower the disease's thrombotic risk and avoid thrombotic consequences such as heart attacks, strokes, deep vein thrombosis, and pulmonary emboli. For individuals with low-risk thrombosis, current polycythemia vera treatments include phlebotomy, low-dose aspirin, and cardiovascular risk factor therapy. Cyto-reduction therapy is advised for patients with high-risk thrombosis. When phlebotomy is intolerable for patients with low-risk diseases, cyto-reduction therapy may also be an option. Hydroxyurea is a component of first-line cyto-reduction therapy for polycythemia vera patients.^{5,6}

An antimetabolite medication called hydroxyurea is used to treat a variety of illnesses, including myeloproliferative disorders like polycythemia vera and chronic myeloid leukemia. By blocking DNA synthesis and deactivating ribonucleotide reductase, hydroxyurea slows down cell division and completely reduces the generation of red blood cells in the bone marrow, reducing the risk of thrombosis.^{1,7}

Germs or a particular collection of germs cause periodontitis, an inflammatory disease of the periodontal tissue that damages the alveolar bone and periodontal ligament by causing pockets to form, gingival recession, or both. In periodontitis, tissue damage that occurs is correlated with many local causal factors in the form of plaque, dental calculus and predisposing factors as well as systemic disease.⁸

Patients with polycythemia vera have a reported incidence of thrombosis ranging

from 12% to 39%, and bleeding problems are predicted to occur in 1,7% to 20% of cases. Depending on the patient's thrombohemorrhagic status, this illness presents differently clinically, and polycythemia vera presents differently orally as well. There is currently a dearth of research outlining polycythemia vera patient's oral presentations and dental care. The literature currently in publication only describes tooth extraction treatments for individuals with this illness.⁵

This case study details the use of flap surgery and bone grafting to preserve teeth and restore healthy periodontal tissue in a patient with polycythemia vera.

CASE REPORT

A 43-year-old man complained to the periodontal clinic about loose teeth for a few years, occasionally bleeding gums after tooth brushing, and receding gums. No complaints of pain, discomfort when chewing. The patient also reported being treated with a hemato-oncologist at RSUP Dr. Sarjito has been diagnosed with polycythemia vera since 2018. The patient is still routinely checked by Hemato-oncology and is currently taking the drug hydroxyurea 500 mg (1x1), after meals.

The patient had a history of smoking but stopped at the age of 23 years. Patients brush their teeth 2x a day (morning and evening). Clinically, the patient's oral hygiene was classified as poor with signs of inflammation throughout the region. The clinical picture is a pocket of 4 – 6 mm, gingival recession of 1 – 7 mm, and tooth mobility of grade 2 – 3 and edentulous in the right and left dental regions of the upper and lower jaw (Figure 1). The radiographic picture shows a general decrease in the alveolar bone with a pattern of horizontal and vertical damage. The patient's diagnosis was chronic generalized periodontitis caused by plaque and calculus aggravated by traumatic occlusion and food retention.



Figure 1: Clinical picture of initial examination



Figure 2: (A) Flap surgery, (B) One week control, (C) Two week

In the early stages, patients receive initial therapy in the form of *Dental Health Education* (DHE) and *scaling and root planing* (SRP). Patients also receive initial therapy in the form of: *fiber composite splinting* on teeth 13 – 23, *occlusal adjustment* with *selective grinding* on teeth 13, 12 and 11. After SRP and the initial therapy treatment above in several areas there has been no significant shallowing of the pockets, so it is planned to carry out flap surgical therapy in the region of teeth 13, 12 and 11. Coordination and clinical evaluation of the patient is carried out by hemato-oncologist for preparation of flap surgery with bone graft application and lidocaine 20 mg with epinephrine 0,0125 mg/ml as a local anesthetic. The results of the evaluation from the hemato-oncologist showed that there were no contraindications for flap surgery. The results of hematological blood tests are in the normal range, good conditions for invasive procedures, blood clotting, and support for tissue healing. Routine hydroxyurea medication was stopped because the hemoglobin and erythrocyte values were slightly below the normal range.

The patient signs *informed consent* before flap surgery. Flap surgery was performed on teeth 13, 12 and 11 with a

pocket depth of 3 – 6 mm (Figure 2A). This periodontal surgery uses DFDBA bone graft and pericardium membrane. Patients are advised to have 1 week control to remove the periodontal pack. The second visit was for control of periodontal pack removal, complaints were only felt when drinking cold drinks. There was still redness around the surgical area (Figure 2B) and the patient was given medication in the form of hyaluronic acid gel. Patients are advised to come 1 week later to have the stitches removed. The results of the evaluation of the third visit, the patient had no complaints of pain, and the stitches had been removed, it appeared that the post-operative wound was still in the healing process (Figure 2C). The patient was advised to undergo control 1 month after surgery and the patient was consulted again to a hematoooncologist for systemic evaluation.

The results of the 1 month control evaluation of normal healing (Figure 3A), and plaque control was carried out and the patient was motivated to maintain oral hygiene, extract teeth 16, 15, 41, 42 and 43 and make dentures. Hydroxyurea medication was resumed, considering that there was an increase in Hb values. The results of clinical evaluation 3 (three) months after flap surgery showed a

reduction in periodontal pockets of 1-3 mm, disappearance of signs of inflammation, and no signs of inflammation. bleeding on probing (Figure 3B). Radiographs show the defect infrabony on

the mesial of tooth 11 has been filled and the bone density in the mesial area of teeth 11, 12, and 13 appears to have increased (Figure 4).

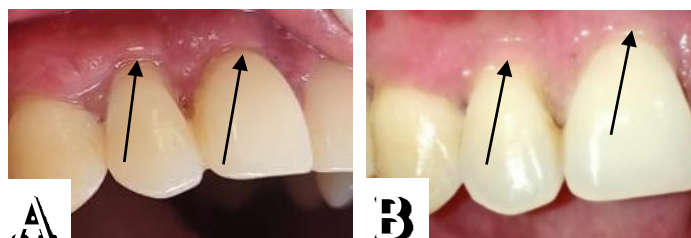


Figure 3: (A) 1 month post-surgery, (B) 3 month control



Figure 4: (A) Ro-photo of initial examination, (B) Ro-photo 3 months after flap surgery

DISCUSSION

A persistent myeloproliferative illness called polycythemia vera developed in multipotent hematopoietic progenitor.⁵ In dentistry, polycythemia vera is an uncommon case that is rarely reported. The risk factors for polycythemia vera include being male and older than 60.³ An antimetabolite medication called hydroxyurea is frequently used to treat a variety of benign and malignant diseases, including malignant melanoma, myelocytic leukemia, and sickle cell anemia.^{5,9} Patients with polycythemia vera may present with oral symptoms such as purple red coloring or pale mucosa on the tongue, cheeks, lips, and gingival; they may also exhibit relative keratosis, different types of candidiasis, mucosal ulcers, spontaneous gingival bleeding, gingival hypertrophy, and poor oral hygiene.⁷ Because hydroxyurea has antiangiogenic effects on blood vessels, erythema, tongue depapillation, and infrequently oral pigmentation, it is known to cause ulcers.^{3,4,10}

A patient with well-controlled polycythemia vera who had a smooth tooth extraction under general anesthesia was described in a case study as having been on a consistent 500 mg hydroxyurea dosage for five years. There was no postoperative infection at the extraction site.^{11,12} A patient with substantial post-extraction bleeding reported in another untreated case of polycythemia vera underwent further dentoalveolar surgery without any problems after receiving phlebotomy treatment.^{13,14}

Synchronized efforts by hematologists and periodontists are necessary for dental treatment, especially invasive therapy. Platelet count <600,000, hemoglobin <16 g/dl, hematocrit value between 42% and 52%, and normal blood volume. Before invasive treatments, polycythemia should be properly treated because reports indicate that in 75% of uncontrolled polycythemia vera patients, bleeding or thrombotic difficulties are present, and of those, 33% died as a result of

complications.³ Before undergoing surgery, patients with polycythemia vera should get treatment with myelosuppressive medications and therapeutic management.⁵

In this case, the patient was considered to be at low risk for thrombosis because he had no previous history of thrombosis or hemorrhage. The process of surgery was performed because her polycythemia vera had been well controlled with doses of myelosuppressive agents (500 mg of hydroxyurea once day) throughout the previous four years. Anesthesia that is safe to use is local anesthesia with vasoconstriction, and suturing is performed to achieve primary closure so that post-surgical bleeding can be controlled well and heal without infection or prolonged bleeding.^{1,15}

In this case, the patient complied and succeeded in maintaining oral hygiene. The most crucial factor influencing the outcome of periodontal therapy is maintaining good oral hygiene. Effective plaque reduction lowers the risks associated with postoperative bleeding in the patients by improving surgical site visualization and soft tissue management. Therefore, patients with polycythemia vera benefit greatly from the periodontist's role in educating them about methods for continuing effective at-home plaque control therapy.

CONCLUSION

Patients with polycythemia vera might present clinically in a variety of ways, ranging from thrombotic to hemorrhagic episodes, which can make periodontal therapy more difficult. Every polycythemia vera case will have medical care tailored to the patient's needs. Therefore, hemato-oncologists and periodontists must collaborate closely and communicate often, especially invasive procedures to prevent complications. The reconstructive surgical procedure with bone graft in this case showed quite good results.

REFERENCE

1. Alshammasi, B., Albasry, Z., & Meshikhes, F. Oral hyperpigmentation associated with hydroxyurea in a patient with polycythemia vera: A case report.

Clinical Case Reports. 2020; 8(10): 1904–1909.

2. Falconer, E. H. Diagnosis and treatment of polycythemia vera. *Postgraduate Medicine*. 1951; 9(4):325–330
3. Sanupa, S., Timy, S., Tiny, S., & Anjhana, N. Polycythemia vera: Gingival and periodontal manifestations and management — A case report. *International Journal of Periodontology and Implantology*. 2022; p. 17805.
4. Bhardwaj, V.K., Sharma, D., Negi S., & Sharma, T. An Atypical oral presentation of polycythemia vera: A case report. *Journal of Dentistry Defence Section*. 2023;17:53-6.
5. Hassan, F.W., & Mohd, N. Periodontal management in a primary polycythemia rubra vera patient: A case report. *Special Care in Dentistry*. 2021; 41(1),92–97.
6. Riswan, M., Oetama, R., & Muhsin, M. Polycythemia vera; The latest clinical aspects and management. *Syiah Kuala Medical Journal*. 2020.
7. Oueslati, Y., Chebil, R.B., Regaieg, H., Oualha, L., & Douki, N. Oral Lichen Planus and Polycythemia: Possible Association. *Case reports in dentistry*.
8. Herawati, D. Combination Therapy of Root Debridement and Antibiotics for Periodontitis Aggressive. *Indonesian Dentistry Magazine*. 2011;18(2), 200–204.
9. Ogunsalu, S & Pepple D. The physiological Basis of the Oral Surgical Management of a Patient with Polycythemia Rubra Vera: A Pathway for the Development of a Protocol. *J. Dent Oral Sci*. 2020;4(1)1-10.
10. Grover, H., Kapoor, S., & Kaushik, N. Polycythemia Vera Dental Management-Case Report. *Journal of Clinical Monitoring and Computing*. 2019;5, O1.
11. Alvarez-Larrán, A., Pérez-Encinas, M., Ferrer-Marín, F., Hernández-Boluda, J.C., Ramírez, M.J., Martínez-López, J., et al. Risk of thrombosis according to need of phlebotomies in patients with polycythemia vera treated with hydroxyurea. *Haematologica*. 2017;102(1), 103–109.
12. Badner, V. M., Lawrence, C., & Mehler, S. Polycythemia vera: dental

- management considerations. *Special Care in Dentistry*. 1991;11(6), 227–230.
13. Carlson, E. R., & Chewning, L. C. (1989). Polycythemia vera in an oral surgical patient A case report. *Oral Surgery, Oral Medicine, Oral Pathology*. 1989; 67(6): 673–675.
 14. Jerry L. How I Treat polycythemia vera. *The American Society of Hematology*, 2019; 134 (4).
 15. Hosseini, A., Abdolsamadi, H., Ronasi N. Oral Squamous Cell Carcinoma Associated with Hydroxyurea Therapy. *Sch. J. Dent. Sci*. 2017; 4(4): 192-195.