

Original article



TREATMENT OF DRY SOCKET WITH PLATELET-RICH FIBRIN

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ABSTRACT:

Purpose: The purpose of this research was to evaluate the possibility of treating dry socket with platelet rich fibrin and to determine time for pain relief and socket epithelisation after treatment.

Material and Methods: Eighteen patients (15 female and 3 male) with a dry socket on both jaws were enrolled in this clinical study. Sixteen of the cases were on the lower jaw, and two were on the upper jaw. To evaluate the subjective feelings of pain after the treatment, we applied a standard visual analogue scale. The level of pain was assessed on the 24th hour, on the 5th and on the 7th day after the treatment. To assess the healing process, we evaluated the socket epithelisation clinically on the 5th, 7th, 10th and 14th day.

Results: In the treated patients the feeling of pain disappeared quickly after the treatment – around the 24th hour (VAS of 24th hour – 1.9 ± 0.38 cm). Complete epithelisation was observed 7-10 days after the treatment.

Conclusion: The results of this study indicate that platelet rich fibrin can be successfully used in the treatment of dry socket.

Keywords: platelet-rich fibrin, dry socket, tooth extraction, pain

INTRODUCTION

Dry socket is a postoperative complication that occurs after tooth extraction. Crawford was the first to describe it in the literature in 1896. [1] There are many different names of dry socket – alveolitis sicca, dry socket, alveolitis sicca dolorosa, alveolar osteitis, local osteitis, fibrinolytic osteitis, septic socket, etc. [2, 3] Dry socket is a postoperative complication that is defined as postoperative pain in the extraction wound with increasing intensity from the first to the third day after the extraction. The process occurs with the partial or total destruction of the blood clot with or without halitosis and with or without affecting the surrounding tissues. [4, 5] The average incidence of dry socket is around 3,5 %, and it can affect both jaws. [2] The incidence of dry socket after tooth extraction on the lower jaw is greater and can reach up to 73% of the total number of extracted teeth. [6] Dry socket

occurs mainly after extraction of impacted and semi-impacted mandibular third molars – up to 45 %. [4] Dry socket affects women up to five times more often than men and is more common in chronic smokers. [7]

Dry socket causes serious physical suffering for the patient, requires extra time and resources for its treatment, making it a socially significant illness. [8] The etiology of dry socket is not fully clarified, but the fibrinolysis and collapse of the blood coagulum as a result of bacterial invasion is the most common cause. [9] The causes of dry socket may be different: traumatic extraction, age, sex, smoking, contraceptive use, high concentration anesthetic, intraligamentary anesthesia, localization of the tooth, etc. [2, 3, 4, 10]

Prevention and treatment of dry socket includes changes in the surgical technique, use of antibiotics, mouth rinsing with antimicrobial agents before the extraction, socket lavage, placement of different medications in the socket, etc. [3, 11, 12] Initially in France clinicians recommend using of PRF following tooth extraction to accelerate healing, reduce postoperative pain and to prevent dry socket. [13] Recently, many authors reported very good results, when using PRF, for prevention of dry socket after removing lower third molars. [14-17]

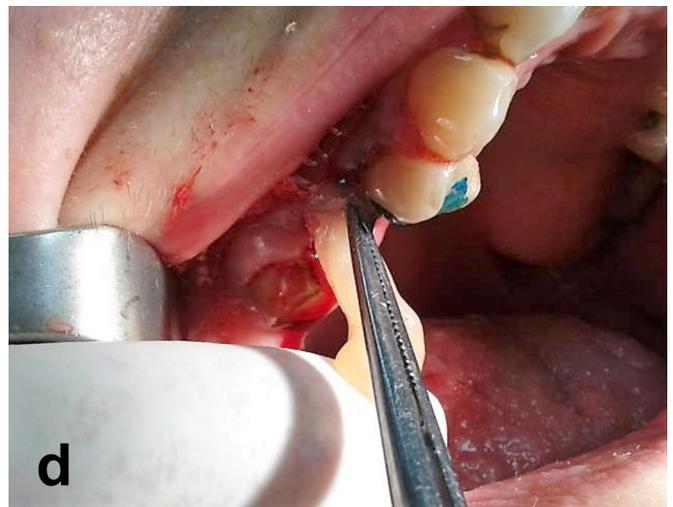
MATERIALS AND METHODS

Eighteen patients (15 women and 3 men) with dry socket were included in the present study. The lower jaw was affected in 16 of the cases and in two of the cases, the upper jaw was affected. All patients were diagnosed and treated in the Department of Oral surgery – FDM-Plovdiv.

Surgical treatment

After adequate anesthesia was documented, the extraction wound was mechanically cleaned with curettes and rinsed thoroughly with 3% oxygen, 10% povidone-iodine and saline. The marginal gingiva around the socket was refreshed using a scalpel. The socket was treated with a sterile gauze and was then filled with PRF. The edges of the wound were then sutured with eight likenesses resorbable or non-resorbable thread 000 or a continuous suture – Fig.1.

Fig. 1. Treatment of dry socket on tooth 15 – a) Dry socket on tooth 15 b) Segmented X-ray in the area of tooth 15 c) Debridement and wipe drying of the extraction socket d) Filling of the socket with PRF membrane e) Suturing of the wound f) Postoperative result after 7 days.



Postoperative care

High-risk patients and such with the compromised medical condition were prescribed antibiotic treatment for a period of 5-7 days (Ampicillin 3x1g). The patients were instructed to maintain oral hygiene and an adequate diet for a period of 7 days. The sutures were removed on the 7th to 10th day after the operation.

Preparation of the PRF

The PRF membrane was prepared following the method of Choukroun J et al. [18] The venous blood, obtained from the patient in a vacuum test-tubes of 10ml, is then immediately put into a centrifuge (PRF DUO) for 8 minutes at 1500 RPM.

Subjective measurements

A standard visual analogue scale – VAS was used to assess the subjective feeling of pain after the treatment. The level of pain was assessed on the 24th hour, 5th and 7th day after the treatment. The results were measured and indexed with the use of a straight line set to the millimeter (the length of the line is exactly 10 cm). The indexes were then rounded to whole values on a scale from 0-10 (0-patient does not experience pain; 10-patient experiences maximum pain). To assess the healing process, we evaluated the socket epithelisation clinically on the 5th, 7th, 10th and 14th day.

RESULTS

The average value of the index of pain that was evaluated with VAS is as follows: 24th hour - 1.9 ± 0.38 cm; 5th day - 1.2 ± 0.8 cm; 7th day - 0.6 ± 0.3 cm. Around the 8th day after the operation complete epithelisation was observed.

DISCUSSION

Treatment of dry socket is a serious issue in the dental practice and requires more time and resources. In most cases, when administered on time, dry sockets subside in several days after conservative or surgical treatment. In some rare cases, the applied measures are insufficient, and patient's complaints can continue for several months, which requires a specialized surgical treatment. [2] Dry socket treatment methods can be divided into three groups: [19] 1. Conservative – Socket lavage with different antiseptic and antibacterial solutions; placement of medication containing antibacterial, analgesic and antifibrinolytic components; laser therapy (Low Level Laser Therapy –

LLLT) [7], etc. 2. Surgical-conservative therapy – anesthesia and curettage of the socket in order to remove the necrotic and infected tissues, together with the dissolved blood coagulum; placement of a medicated dressing in the socket; suturing of the socket. 3. Radical surgical treatment - anesthesia and curettage of the socket in order to remove the necrotic and infected hard and soft tissues; plastic covering of the socket with a mucoperiosteal flap with adjacent tissues. When required, local treatment is combined with a systematic intake of antibiotics and analgetics for a period of 5 to 10 days.

Many authors report that PRF contains a majority of growth factors and other biologically active substances, which support the processes of revascularization and regeneration of hard and soft tissues. In 2016 Singh M and Ranganatha N. [20] published research in which they use PRF to treat dry socket. They compared the process of healing of a socket filled with a paste made of zink oxide and eugenol paste, Alvogyl and PRF. The authors measured the pain levels on the 24th hour and on the 7th day after the treatment. They also measured the level of epithelisation of the socket on the 7th day after the treatment. The results of this study indicate that using PRF and zink oxide with eugenol shows a more rapid healing process. The epithelisation is most distinct on the 7th day when using PRF.

The anamnesis from the patients treated with PRF in this study (18 patients with a dry socket in different places of the jaws) revealed pain complaints dating from 30 to 90 days post extraction. Numerous unsuccessful attempts have been made to treat those patients with conservative and conservative-surgical treatment of the socket. After the applied PRF treatment of the examined patients with dry socket, the pain levels subsided rapidly after the treatment (VAS on 24th hour – 1.9 ± 0.38 cm). Complete epithelisation of the socket can be observed around 8 days after the operation – Fig. 1f. The results of our study corroborate those of other authors. [20]

CONCLUSION

The results of this study indicate that platelet-rich fibrin (PRF) can be successfully used for the treatment of dry socket. According to us, the advantages of this method are that it is easy to execute, can be performed by every dentist, and has a rapid influence on pain levels, followed by a quick epithelisation of the socket.

REFERENCES:

1. Atanasov D. (Editor). [Oral surgery.] *Tafprint, Plovdiv*, 2011: 255-259. [in Bulgarian]
2. Chenchev Iv, Cholakova R, Kanazirski N, Neychev D. [Influence of oral contraception and smoking on occurrence a dry socket.] *Scientific Research of Union of Scientists in Bulgaria-Plovdiv. Medicine, Pharmacy and Dental medicine*. 2007; series G (VIII): 278-281. [in Bulgarian]
3. Parthasarathi K, Smith A, Chandu A. Factors affecting incidence of dry socket: a prospective community-based study. *J Oral Maxillofac Surg*. 2011 Jul;69(7):1880-4. [PubMed] [CrossRef]
4. Cardoso C L, Rodrigues M V, Ferreira O, Garlet G P, de Carvalho PP, Clinical concepts of dry socket. *J Oral Maxillofac Surg*. 2010 Aug;68(8):1922-32. [PubMed] [CrossRef]
5. Blum IR. Contemporary views on dry socket (alveolar osteitis): a clinical appraisal of standardization, aetio-pathogenesis and management: a critical review. *Int J Oral Maxillofac*

Surg. 2002 Jun;31(3):309-17. [PubMed] [CrossRef]

6. Pitekova L, Satko I, Novotnakova D. Complication after third molar surgery. *Bratisl Lek Listy.* 2010; 111(5):296-298.

7. Karnure M, Munot N. Review on conventional and novel Techniques for treatment of alveolar osteitis. *Asian J Pharm Clin Res.* 2013; 6(3):13-17.

8. Hoaglin DR, Lines GK. Prevention of Localized Osteitis in Mandibular Third-Molar Sites Using Platelet-Rich Fibrin. *Int J Dent.* 2013; Article ID 875380, 4 pages. [CrossRef]

9. Houston JP, Mc Collum J, Pietz D, Schneck D. Alveolar osteitis: a review of its etiology, prevention and treatment modalities. *Gen Dent.* 2002 Sep-Oct;50(5):457-63. [PubMed]

10. Kolokythas A, Olech E, Miloro M. Alveolar osteitis: a comprehensive review of concepts and controversies. *Int J Dent.* 2010; Article ID 249073, 10 pages. [CrossRef]

11. Mancuso JD, Bennion JW, Hull MJ, Winterholler BW. Platelet-rich plasma: a preliminary report in routine impacted mandibular third molar sur-

gery and the prevention of alveolar osteitis. *J Oral Maxillofac Surg.* 2003; 61(8: article 40).

12. Celio-Mariano R, de Melo WM, Carneiro-Avelino C. Comparative radiographic evaluation of alveolar bone healing associated with autologous platelet-rich plasma after impacted mandibular third molar surgery. *J Oral Maxillofac Surg.* 2012 Jan; 70(1):19-24. [PubMed] [CrossRef]

13. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, et al. Platelet-rich fibrin (PRF): a second-generation platelet concentrate-part II: platelet-related biologic features. *Oral Sur Oral Med Oral Pathol Oral Radiol Endod.* 2006 Mar;101(3):e45-50. [PubMed] [CrossRef]

14. Uyanik LO, Bilginaylar K, Etikan I. Effects of platelet-rich fibrin and piezosurgery on impacted mandibular third molar surgery outcomes. *Head Face Med.* 2015 Jul 26;11:25. [PubMed] [CrossRef]

15. Biliginaylar K, Uyanik LO. Evaluation of the effects of platelet-rich fibrin and piezosurgery on outcomes after removal of impacted mandibular third molars. *Br J Oral*

Maxillofac Surg. 2016 Jul;54(6):629-33. [PubMed] [CrossRef]

16. Al-Hamed FS, Tawfik M, Abdelfadil E. Clinical effects of platelet-rich fibrin (PRF) following surgical extraction of lower third molar. *Saudi J Dent Res.* 2017 Jan-Jul;8(1-2):19-25. [CrossRef]

17. Eshgphour M, Dastmalchi P, Nekovei AH, Nejat AH. Effect of Platelet-Rich Fibrin on Frequency of Alveolar Osteitis Following Mandibular Third Molar Surgery: A double-blinded randomized clinical trial. *J Oral Maxillofac Surg.* 2014 Aug; 72(8):1463-7. [PubMed] [CrossRef]

18. Choukroun J, Adda F, Schoeffer C, Vervelle A. PRF: an opportunity in perio-implantology, [in French] *Implantodontie.* 2000; 42:55-62.

19. Katanec D, Blazekovic AM, Ivanovic Z, Pavelic B, Kuna T. Postextraction pain treatment possibilities. *Acta Stomatol Croat.* 2003; 37(4):471-75.

20. Singh M, Ranganatha N. Incidence Etiology and Treatment of Alveolar Osteitis. *Int J Recent Advances in Multidisciplinary Research.* 2016; 3(1):1167-70.

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