

## CLINIC, MICROBIOLOGIC, AND HISTOPATHOLOGIC INVESTIGATION OF SYSTEMIC EFFECTS OF ORNIDAZOL IN TREATMENT OF ALVEOLITIS

**TÜRKAN KARABIYIKOGLU\***  
**HALUK OZTUNÇ\***

*SUMMARY: This study carried on 30 cases with alveolitis. The patients were divided into 3 different treatment groups each consisting of 10 individuals. The pre-and post-treatment clinical (pain, mouth odor and lymphadenopathy) microbiologic and histopathologic findings were statistically compared in 3 groups. As a result of our findings we concluded that the quickest and most efficient method in alveolitis treatment is irrigation with rivanol solution following curettage of the inflamed area and oral antibiotic (ornidazol) therapy.*

*Key Words: Alveolitis, Ornidazol, Curettage, Rivanol.*

### INTRODUCTION

Alveolitis which is seen frequently during wound healing after tooth extraction. It was first described by Crawford in 1896 (1,2).

Alveolitis occurs in the 2nd or 3rd day following extraction. It's seen after 20-30% mandibular 3rd molar, 2-4.4 % of all the other tooth extractions. The first symptoms are pain and mouth odor (3,4,5). Clinically the clot is missing, the bone surface is sensitive, the alveolus is filled with necrotic remnants yellowish-green in color and the gingiva around the area is inflamed (4,6,7). The person is indisposed, unwell and suffers from sleeplessness. High fever and local lymphadenopathy is also observed (4,6,8).

There are many ideas about the etiology of alveolitis (4,5,7,9,12).

Although the bacteriologic studies on orofacial infection have proved that there are many different bacteria involved, it has been shown that the effective ones are anaerobes, and among them the most frequently seen are gram (-)

bacteria (13-16). It has been stated that the reasons of oral infections other than alveolitis (actinomycosis, periapical osteitis, candidiasis, osteomyelitis of mandible, dental abscess etc.) are mostly also anaerobic bacteria (17,18).

For the treatment of alveolitis, beside the use of different antibiotics, analgesics and antiseptic solutions have also been used (3,4,19). Gluco-corticosteroids and antihistaminics have been utilized to support the treatment (4,20).

Different antibiotics (aminoglycoside group antibiotics, trimidazole, metronidazol, ornidazol etc.) have been used to treat some orofacial infections caused by anaerobic bacteria as these bacteria had developed resistance to some antibiotics (i.e. bacteroides to  $\beta$ -lactamase producing penicilline) (14,15,20,23,25).

Because the etiology and pathogenesis of alveolitis are not sufficiently elucidated methods are being tried in treatment. As a matter of fact, there's no specific treatment method, although many have been suggested.

This study is planned to compare the 3 different treatment methods most commonly used to day.

\*From Oral Diagnose and Radiology Division, Faculty of Dentistry, Hacettepe University, Ankara, Türkiye.

**MATERIAL AND METHOD**

The study was carried on 30 patients who complained of pain especially at the area of extraction in Hacettepe University, Faculty of Dentistry, Department of Oral Surgery between September 1987 and January 1988.

Age and sex of patients was not taken into account and the extracted teeth were not classified. Only the systemic diseases were investigated. Prior to treatment clinical findings were evaluated. Histopathologic and microbiologic examinations of biopsies and cultures which had been taken from alveols of all patients were done.

Patients were divided into 3 groups each consisting of 10 individuals and the following treatment methods were applied:

1st group: Curretage + irrigation (0.1 % Rivanol solution)

2nd group: Curretage + irrigation + pat (alvogyl)

3rd group: Curretage + irrigation + systemic antibiotic (ornidazol 2x2 capsules per day for 4 days).

Four days after the beginning treatment histopathologic, microbiologic and clinical examinations were done and the findings were compared with that of the first day. Significance of differences were evaluated using Ki-square test.

**RESULTS**

**Clinical Findings**

Pre-and post-treatment clinical findings of 3 groups of patients is shown in Table 1.

In the 1st group the differences between pre-and post-treatment clinical findings of pain and lymphadenopathy were significant ( $p < 0.05$ ) but findings of mouth odor were not significant ( $p > 0.05$ ) statistically.

In the 2nd group the differences between findings of mouth odor and lymphadenopathy were significant ( $p > 0.05$ ) but findings of pain were not significant ( $p > 0.05$ ) statistically.

In the 3rd group differences between all 3 clinical findings were significant ( $p < 0.05$ ) statistically.

**Microbiologic Findings**

Anaerob bacterial (mostly bacteriodes, peptostreptococcus, veillonella, difteroid) growth had been seen in all the cultures of 3 groups before treatment. After the treatment growth was seen in 7 cultures of 1st group, 7 cultures of 2nd group, but 3 cultures of 3rd group (Table II).

Table 1: Pre-and post-treatment clinical signs in 3 different treatment groups.

Treatment Groups	Cases (n)	Ext. tooth				Clinical signs					
						Pain		M. odor		Lymph ad.	
						Pretr.	Posttr.	Pretr.	Posttr.	Pretr.	Posttr.
Curretage + irrigation	n : 10	4	6	3	3	10	6	6	3	4	1
		n:3	n:3	n:3	n:1	P < 0.05		P > 0.05		P < 0.05	
Curretage + irrigation + Pat (alvogyl)	n : 10	8	6	2	7	10	8	9	3	7	0
		n:6	n:2	n:1	n:1	P > 0.05		P < 0.05		P < 0.05	
Curretage + irrigation + S. antibiotic	n : 10	8	7	5	1	10	2	8	0	5	0
		n:6	n:1	n:1	n:2	P < 0.05		P < 0.05		P < 0.05	

Table 2: Microbiological findings in 3 different treatment groups.

Treatment Groups	Cases (n)	Bacteriodes		Peptostrept.		Veillonella		Difteroid	
		Pretr.	Posttr.	Pretr.	Posttr.	Pretr.	Posttr.	Pretr.	Posttr.
Curretage + irrigation	n:10	3	2	-	1	2	3	1	1
Curretage + irrigation + Pat (alvogyl)	n:10	7	5	3	2	-	-	1	-
Curretage + irrigation + S. Antibiotic	n:10	7	1	1	3	2	-	2	-

Statistical evaluation of these findings proved that the difference in the 1st and 2nd group was not significant ( $p>0.05$ ) but the difference in the 3rd group was significant ( $p<0.05$ ).

### Histopathologic Findings

No evident difference was found between pre-and post-treatment histopathologic findings in three groups. Acute infection cells (polymorphonuclear leukocytes and lymphocytes) which had been seen before the treatment was also seen to a less extent after the treatment. Most impressive reduction was observed in the 3rd group.

### DISCUSSION

Alveolitis is the most frequently seen complication following tooth extraction (2,3,6,11).

There are many ideas about the etiology and treatment of alveolitis (2-4, 6, 12).

Some researchers have claimed that alveolitis is seen mostly after single tooth extractions rather than multiple tooth extractions. The reasons of single tooth extractions are mainly caries or orthodontic purposes, it's a traumatic procedure. On the other hand, the reason of multiple tooth extractions are periodontal diseases, so they're less traumatic (2-4). These fit the condition of patients who involved in this study, as they developed alveolitis after single tooth extractions.

A group of researchers have used saline solution to irrigate the alveol and put BIPP (Bitmuth iodoform parafin paste) impregnated sponge. In case of severe pain analgesics have been used (4).

In our study after the curettage of alveolus we used 0.1% rivanol solution for irrigation in the 1st group. In the 2nd group we used alvogyl (iodoform butylparaamino benzoate eugenol penghauvar excipient) pat additionally.

Although there are some ideas to the contrary in the late studies systemic and local antibiotics are being frequently used to treat different kinds of oral infections. Gusperit *et al.* in addition to mechanical treatment, have used oral ornidazol (Biteral) on patients with paradontitis margins for 10 days and have stated that the complaints and anaerobe bacteria decreased evidently (2,4,15,17,22).

As a matter of fact, in the 3rd group on which we applied curettage + irrigation + systemic antibiotic treatment, mouth odor and lymphadenopathy is completely lost, but pain continued in 3 patients.

Oguntebi *et al.* have stated that the most frequently isolated species in orofacial infections were fusobacterium nucleatum, and peptostreptococcus mitis. Chow and all have isolated bacterioides, peptostreptococcus and streptococcus (26-28, 30).

Species of anaerob bacteria that we isolated in our study are similar to these which have been isolated by these researchers. Although we observed bacterial

growth in all cultures of 3 groups before treatment, 4 days after treatment bacterial growth was not observed in 3 cultures of 1st group, 3 cultures of 2nd group and 7 cultures of 3rd group.

Saxer and Guggenheim (31) have applied 1 gr/day ornidazol to 19 patients with post-juvenile periodontitis for 10 days and have observed a 77% decrease in bacterioides. Sengün *et al.* (32) have stated that local ornidazol treatment was effective on patients with periodontal treatment was effective on 10 patients with periodontitis. Külekçi and Ang (33) have reported that anaerob bacteria which they had isolated from 14 abcess of tooth origin, were sensitive to ornidazol in vitro.

Acute infection cells (polymorphonuclear leukocytes and lymphocytes) disappear after 10-15 days or even more (2).

In our study acute infection cells didn't disappear entirely after treatment in all 3 groups. Presence of acute infection cells in 3rd group (lesser than 1 st and 2 nd groups) can be explained by the shortness of treatment time. The reason of this shortness is to find the quickest and most efficient treatment method.

Nowadays agents which are known to have antifibrinolytic effects such as EACA (epsilon amino caproic acid), PEPH (Propytic ester  $\beta$ -hydroxy benzoic acid) traneksamic acid, trasilol, prophylhydroxy benzoic acid and apermil are being used to prevent from or treat alveolitis depending upon the theory that alveolitis develops due to the increase in fibrinolytic activity (4,12).

### REFERENCES

1. Olson RAJ, DL Roberts, DB Obson: A comparative study of polyactic acid gelfoam and surgical in healing extraction sites. *Oral Surg.* 53:441-449, 1982.
2. Shafer WG, MK Heine, BM Levy: *Textbook of Oral Pathology.* 2nd Ed., WB Saunders Comp., Philadelphia and London, pp: 494-501, 1969.
3. Mitchell DF, SM Standish, JM Fast: *Oral diagnosis-Oral Medicine,* 1st Ed., Lea and Febiger, Philadelphia, pp: 226-227, 1969.
4. Moore JR: *Surgery of the mouth and jaws.* 1st Ed., Blackwell Scientific Publications, Oxford and London, pp: 405-406, 1985.
5. Schofield IDF, BA Warren, J Rozanis: *Review of localized osteitis.* *J Can Dent Assoc.* 3:189-194, 1980.
6. Birn H: *Etiology and pathogenesis of fibrinolytic alveolitis.* *Int J Oral Surg.* 2:257-267, 1973.
7. Sweet JB, DP Butler: *The relationship of smoking to localized osteitis.* *J Oral Surg.* 37:732-735, 1979.
8. Ritzau M: *The prophylactic use of tranexamic acid (Cyclo-capron) on alveolitis Sicca dolorosa.* *Int J Oral Surg.* 2: 196-199, 1973.
9. Birn H: *Fibrinolytic activity in "Dry Socket".* *Acta Odontol Scand.* 28:37-58, 1970.
10. Catellani JE, S Harvey, SH Erickson, D Cherkin: *Effect of oral contracteptive cycle on dry socket (localized alveolar osteitis).* *JADA* 101:777-780, 1980.

11. Mac Gregor AJ: Etiology of alveolar osteitis. *J Oral Surg.* 37:465, 1979.
12. Tasar F, N Erensoy: Alveolitis ve tedavisi, *HÜ Dis Hek Fak Derg.* 8:1-7, 1984.
13. Partlett JG, PO Keefe: The bacteriology of perimandibular spece infections. *J Oral Surg.* 37:407-409, 1979.
14. Konow LV: Orofacial infection and nitroimidazoles. *Akademisk Auhadling.* Pp: 6-12, 1982.
15. Know LV, CE Nord: Omidazole compared to phenoxy-methylpenicillin in the treatment of orofacial infections. *J Antimicrobial Chemotherapy* 11:207, 1983.
16. Nastro LJ, SM Finegold: Endocarditis due to anaerobic gram-negatif bacilli. *Am J Med.* 54:482-496, 1973.
17. Bystedt H, LV Konow, CE Nord: Effect of tinidazole on postoperative complications after surgical removal of impacted mandibular third molars. *Scand J Inf Dis Suppl.* 26:135-139, 1981.
18. Marsh P: *Oral Microbiology.* 1st Ed, pp:80-81, 1980.
19. Mumford JM: *Orofacial pain.* 3rd Ed. London and New York, pp:265-267, 1982.
20. Hooley RJ, HT Hohl: Use of steroids in the prevention of some complications after traumatic oral surgery. *J Oral Surg.* 32:864-866, 1974.
21. Akalin HE, I Köksal, T Kardes, M Baykal: Gram-negatif bakterilerin aminoglycoside ve beta-lactam grubu antibiyotiklere duyarliliklari. *KÜKEM Derg.* 9:125, 1986.
22. Akalin HE, Y Ozisik, A Oktay, A Oto, M Baykal: Multipl dirençli gram-negatif bakterilerle gelisen enfeksiyonlarin amikacin ile tedavisi. *KÜKEM Derg.* 9:126, 1986.
23. Anaerob mikroorganizma enfeksiyonlarinin profilaksi ve tedavisinde ornidazol. *Roche Yayinlari,* 1984.
24. Katircioglu S, R Etaner, V Kayhan, T Sunay, I Savas, C Aktan: Preoperatif radyoterapi görmüs larinks kanseri olgularinda anaerob enfeksiyonlar yönünden tedavi. *Roche Yayinlari,* 1978.
25. Köksal I, F Tunçkanat, T Kardes, M Baykal, HE Akalin: Kan kültürlerinden izole edilen gram-negatif bakterilerin antibiyotik duyarliliklari. *KÜKEM Derg.* 9:179, 1986.
26. Head TW, KC Bentley, EP Millar, JA de Vries: A comparative study of the effectiveness of metronidazole and penicillin V in eliminating anaerobes from postextraction bacteremias. *Oral Surg.* 58:152-155, 1984.
27. Sabiston CB, WA Gold: Anaerobic bacteria in oral infections. *Oral Surg.* 38:187, 1974.
28. Oguntebi B, AM Slee, JM Tanzer, K Longeland: Predonant microflora associated with human dental periapical abscesses. *J Clin Mic.* 15:964, 1982.
29. Williams BL, JF MacCann, FD Schoenkecht: Bacteriology of dental abscess of endodontic origin. *J Clin Mic* 18:77, 1983.
30. Chow AW, SM Rosen, FA Brady: Orofacial odontogenic-infections. *Ann Int Med,* 88:392, 1978.
31. Saxer UP, B Guggenheim: Omidazol (Biteral) in the treatment of periodontal disease. Zurich, 14 May 1983.
32. Sengün D, R Alacam, Aberberoglu, T Alpagut: Periodontitis de lokal ornidazol uygulamasinin mikrobiyolojik olarak incelenmesi, *HÜ Dis Hek Fak Derg,* 11:139-141, 1987.
33. Külekçi G, O Ang: Abse cerahatlerinden izole edilen anaerob bakterilerin ornidazol'e in vitro duyarliliklari. *Oral Derg.* 21:15-22, 1986.

Correspondence:  
Doç. Dr. Türkan Karabiyikoglu  
Hacettepe Üniversitesi,  
Dişçilik Fakültesi,  
Ankara, TÜRKİYE.