

HEMATOLOGY OF THE DENTAL PULP ON VITAL PULPOTOMY

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生活齒髓切斷術時齒髓内の 血液像에 關한 研究

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(指導 金 洙 哲 教授)

金 榮 在

..... > 국문 초록 <

저자는 임상적 진단과 치수내 혈액상과의 관계를 규명하기 위하여 치아 우식증에 의하여 심부로 이환된 이십개의 치아를 선택하여 齒髓切斷術을 施行한 後 其 血液을 檢討한 結果 다음과 같은 결론을 얻었다.

1. 임상적으로 치수충혈로 진단된 일곱개의 치아중, 세개의 혈액표본은 정상 혈액상을 나타냈고 두개의 혈액표본은 약간의 급성 염증상을 나타냈으나 나머지 두개의 혈액표본은 심한 만성 염증상을 나타냈다.
2. 임상적으로 급성치수염으로 진단된 열세개의 치아중, 열개의 혈액표본은 심한 만성 염증상을 나타냈고 한개의 혈액표본은 약간의 만성 염증상을 나타냈으며 나머지 두개의 혈액표본은 급성 염증상을 나타냈다.

INTRODUCTION

Vital pulp therapy in the form of pulp capping and pulpotomy has long been recognized as a procedure designed to maintain the vitality of the exposed dental pulp by caries.¹⁾ Although the procedure has been widely accepted, the results experienced by the clinician and researcher have often been discouraging. Some investigators have suggested that the degree of success to maintain pulp vitality is largely rely upon the selectiong of cases.²³⁾

Schroff⁴⁾ has stated that it is of paramount importance to know the status of the pulp tissue we are attempting to treat. It is well recognized, however that the commonly used clinical diagnostic method are limited and often do not reflect the true status of the dental pulp in a tooth with an extensive carious lesion.

It was suggested by Prader⁵⁾ in 1949 that a white blood cell differential count from the first drop of blood of an exposed dental pulp will indicate the true pulpal condition. He

mentioned that the white blood cell hemogram of the intact healthy pulp without inflammation is identical to the circulating blood of the patient. He indicated successful pulp therapy could be accomplished when lymphocytes and monocytes predominated or when the pulp hemogram was comparable to that of the peripheral blood.

Bevilacqua⁷⁾ claimed to have corroborated Prader's finding with the pulp hemogram.

Bender, Ziontz, Saltzer, Kauffman(1961, 1963) reported that inflammatory cells (mainly macrophages and lymphocytes, with occasional polymorphonuclear leukocytes) were found in the pulp primarily in the region under the reparative dentine and the presence of polymorphonuclear leukocytes between the odontoblast and the predentine is characteristic of severe inflammatory response. Apparently the function of polymorphonuclear leukocytes is to phagocytize the dead and degenerating odontoblasts and their products. Neutrophils occasionally squeeze into the dental tubules. In acute inflammation, the cells infiltrating the connective tissue are neutrophils in chronic inflammation. They are lymphocytes, plasma cells, macrophages and small round cells.

Guthrie,⁸⁾ McDonald and Mitchel(1965) reported neutrophils and lymphocytes counts showed 10% or more rise to compare to the peripheral hemogram. If the pulp blood count was within 10% of the peripheral hemogram, it was considered normal.

Excessive hemorrhage from an exposed pulp is one of contraindication for vital pulp therapy the degree of mobility or tenderness to percussion was of no particular value in determining the degree of pulpitis.

A history of spontaneous pain was a more reliable characteristic of extensive pulpitis than was a history of pain occurring while eating. The purpose of this investigation was to determine if a relationship between the white blood cell differential count obtained from the first drop of blood of an exposed dental pulp and the clinical signs or symptoms of pulpitis.

MATERIALS AND METHODS

20 cases of deep carious teeth which 15 cases of them are deciduous molars and 5 cases are permanent molars were selected for dental pulp hemogram. Routine diagnostic procedure was taken by a small pallet saturated by cold and hot water, response for percussion and gradience of mobility on the affected tooth and adjacent teeth.

The tooth was classified to the hyperemia and the pulpitis by the clinical signs and symptoms.

The affected tooth was isolated by spoon excavator and a large round bur. The first drop of bleeding from the exposed pulp was carried on a clean microscopic slide by a cotton plier and blood specimen was prepared on the slide. The dried film was stained by the staining method of Wright which is the almost universal choice for routine hematology and a count was made.

RESULTS

20 cases of deep carious teeth examined by white blood cell differential count.

7 cases of these were diagnosed clinically as hyperemia and the others were diagnosed clinically as pulpitis.

These homograms were compared to the clinical diagnosis.

1. Hyperemic group(7 Cases)

4 cases of hyperemic group appealed pain at mealtime and 1 case was sensitive to cold irritation, and the other 2 cases had often experienced pain.

3 blood specimens of teeth showed normal hemograms and 2 cases showed very high lymphocyte counts, and the other 2 cases showed some high neutrophil counts.

2. Pulpitic group(13 Cases)

In 6 cases of pulpitic group, the pain was experienced at night, and 2 cases experienced the continuous pain, and 2 cases experienced the intermittent pain and the other 2

	White Blood Cell Differential Count				Baso.	Clinical Diagnosis	Hematologic Finding	Clinical signs and Symptoms
	Stab(neutro) Seg.(neutro)	Lym-ph.	Mo-no.	Eosi-no.				
1	1%(62%)61%	37%	1%			hyperemia	normal state	cold response⊕
2	1%(63%)62%	31%		6%		hyperemia	"	food im paction pain
3	(41%)41%	59%				hyperemia	chronic inflammation	food im-paction pain severe hemorrhage
4	2%(51%)49%	49%				hyperemia	"	
5	1%(74%)73%	24%	1%	1%		hyperemia	acute inflammation	foot impation pain
6	2%(63%)61%	36%	1%			hyperemia	nomal state	
7	2%(70%)68%	30%				hyperemia	acute in flamm ation	food impaction pain cold response⊕
8	1%(36%)35%	60%	1%	3%		acute pulpitis	chronic inflam.	cold response⊕ heat response⊕
9	(43%)43%	55%	2%			acute pulpitis	severe chronic inflammation	severe hemorrhage percussion⊕
10	(47%)47%	52%		1%		acute pulpitis	"	
11	(46%)46%	53%	1%			"	"	night pain
12	1%(37%)36%	59%	2%	1%	1%	"	"	food impaction pain night pain
13	2%(39%)37%	59%		2%		"	"	heat riesponse⊕ continuous pain
14	(23%)23%	76%	1%			"	chronic inflammation	night pain
15	2%(47%)45%	53%				"	chronic inflammation	continuous pain heat response⊕
16	2%(48%)46%	50%		2%		"	"	cold response⊕ heat response⊕
17	(70%)70%	29%	1%			"	acute inflamm- ation	intermittent pain heat response⊕
18	3%(42%)39%	56%	1%	1%		"	chronic inflammation	night pain heat response⊕
19	4%(69%)65%	30%	1%			"	acute inflammation	intermittent pain percussion⊕
20	4%(59%)55%	40%	1%			"	chronic inflammation	night pain

cases showed response for percussion.

10 specimens of these teeth showed very high lymphocyte counts and 1 case showed high lymphocyte count, and the other 2 case showed some high neutrophil counts.

Totally, 11 cases of pulpitic group and 2 cases of hyperemic group showed a high lymphocyte counts, and 4 cases of all showed some high neutrophil counts, and 3 cases showed normal hemgrams.

DISCUSSION

In result, these pulp hemogram revealed to mostly correspond with the clinical diagnosis. 3 blood specimens out of seven teeth which were diagnosed clinically as hyperemia showed normal hemograms and 2 cases showed high lymphocyte count(54%), and the other 2 cases showed some high neutrophil count(abont 72%), 2 cases didn't correspond with the clinical diagnosis and revealed severe chronic inflammation and the other 2 cases revealed the early stage of acute inflammation.

13 teeth diagnosed as pulpitis clinically showed mostly severe chronic inflammation and two of these showed some high neutrophil count(70%). Most of pulpitic group revealed the high evaluation of lymphocyte count and experienced the spontaneouse pain or night intermittent pain. And the tenderness to percussion was not affected to the degree of pulpitis.

Prader claimed that a pulp hemogram showing a high neutrophil count was an indication that the tooth would not respond favorably to vital pulpotomy.

Guthrie reported that the night pain revealed the degree of inflammation and it revealed the internal resorption histologically and the inflammation extended to the deep lesion.

CONCLUSION

Twenty deep carious teeth were selected to determine a relationship between the dental pulp hemogram and the clinical diagnosis.

1. Three blood specimens of seven teeth which were diagnosed clinically as hyperemia revealed normal hemograms and two cases revealed severe chronic inflammation, and the other two cases revealed acute inflammation.

2. Ten specimens of thirteen which were diagnosed clinically as pulpitis revealed severe chronic inflammation and one case revealed chronic inflammation and the other two cases revealed acute inflammation.

= ACKNOWLEDGEMENT =

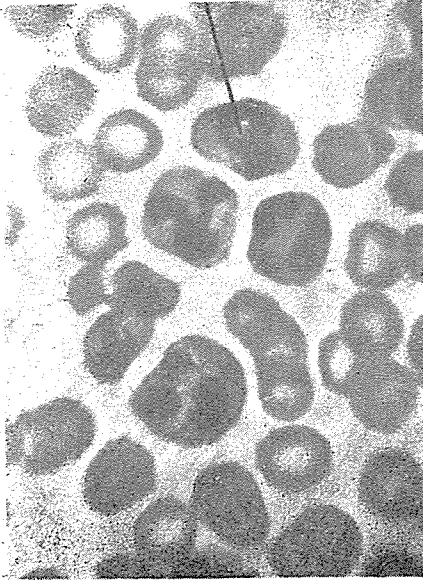
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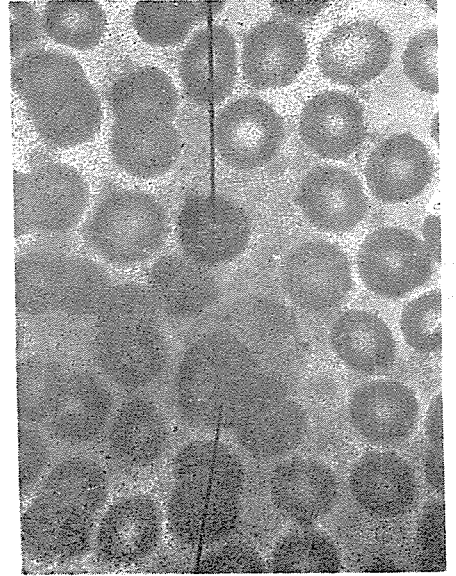
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Segment neutrophil

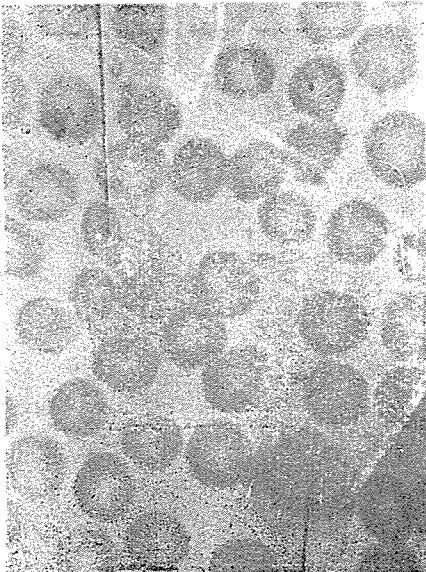


Lymphocyte

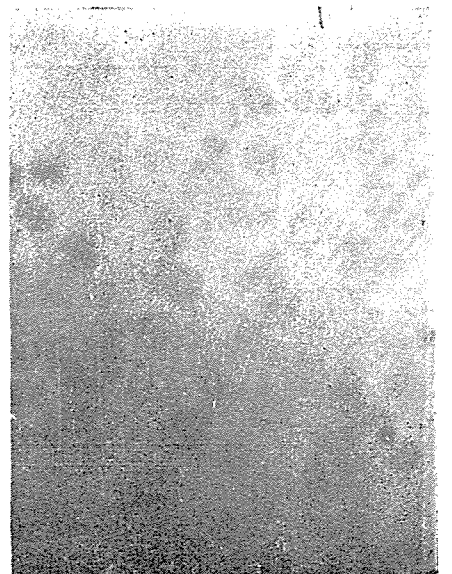


Monocyte

Segment neutrophil



Eosinophil



Lymphocyte