Management of Pyogenic Granuloma (Clinicopathological Study)

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Abstract

Background: Pyogenic granuloma is a common oral cavity reactive lesion of. Injuries, calculus and hormonal changes are the common causative factors. It is often arises in the second decade of life as exophytic smooth lesion, mostly bleeds on simple probing. The study aimed to evaluate clinicopathological findings of pyogenic granuloma.

Materials: A total of 54 patients (including 40 male and 14 female) have been enrolled in this study subjected to surgical excision of pyogenic granuloma by diode laser 940nm**.** All the specimens were undergo a standard tissue processing procedure subsequently the paraffin embedded blocks were sliced in 5µm thickness into a clean glass slide and prepared to H & E staining and all slides were examined using light microspore. All cases in this study undergone surgical excision of pyogenic granuloma aged from 8 to 53 years (mean= 27 years) with the peak incidence of occurrence (44.5 %) in the (11-20 years) age group.

Conclusions: Pyogenic granulomas were most prevalent in male (74%) than female (26%). Oral pyogenic granuloma is a very common oral cavity occurring reactive lesion, mostly painless benign growth. Surgical excision with removal of etiological causes is the major treatment.

Keywords*: pyogenic granuloma, oral pathology, oral lesion, oral tumors, benign tumors*

Introduction

Pyogenic granulomas are common benign, non-neoplastic, localized, soft tissue lesions that misnomer as they neither represent a true granuloma nor infection with pyogenic micro-organisms [1] . Anyhow, pyogenic granuloma has been retained in the literature since coined by Hartzell in 1904 because of its historic significance [2,3]. In pathological sciences pyogenic granulomas are known as granuloma gravidarum, granulation tissue-type haemangioma, lobular capillary haemangioma, eruptive haemangioma, or pregnancy tumor [4,5]. Pyogenic granulomas occur anywhere in oral cavity, head and neck region, trunk and extremities [6]. Scientifically many monographs proposed that low-grad injury from physical trauma or infection or chronic irritation from retained roots and/or dental calculus was the principle etiological factor in evolution of pyogenic granulomas [7,8,9]. Indeed, other studies offering certain drugs such as cyclosporine and hormonal alterations during puberty or pregnancy as causative factors in the development of the lesions [10]. Although numerous lesions resemble clinically with pyogenic granuloma arising in the oral

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cavity but a detailed history reinforced with proper treatment plan and carful histopathological examination will be useful to accurately identifies the lesion [11]. Pyogenic granuloma extirpation is correct treatment of choice, plenty alternative therapy such as lectrosurgery, sclerotherapy, cryosurgery, corticosteroid or ethanol injection and laser therapy have been declared to be effective [10,12]. The abundant vascular nature of pyogenic granulomas required careful excision to avoid profuse bleeding. The excision by laser offer great advantage than conventional surgical excision in controlling bleeding through the surgical procedure [11,12]. Pyogenic granuloma has an extremely increased recurrence rate with simple surgical ablation [13]. Perfect treatment of pyogenic granuloma required correct removal of whole lesion to prevent its recurrence [12]. The study aimed to evaluate clinicopathological findings of pyogenic granuloma in Iraq

Materials and Methods

A total of 54 patients (14 female and 40 male) have been enrolled in this study subjected to surgical excision of pyogenic granuloma in Ramadi Teaching Hospital, Razi Private Hospital and Private Dental Clinic in the Province of Anbar. This study was approved by Department of Scientific Affairs at College of Dentistry and was approved by Ethical Approval Committee at University of Anbar under Ref no. (6) On 24th of January, 2021. . The patient consent form was obtained prior to surgery and the detailing of laser procedure was elucidated to the patients. Demographical information including patient`s name, age, sex, medical condition, past dental history and clinical examination of the features of the lesion (site, size, duration, color, texture of the lesion) were recorded and analyzed. The treatment plan included oral prophylaxis by preoperative intraoral antisepsis with Listerine mouth wash for about 30 seconds and safety goggles were worn for patients and surgical teams as eyes should be safeguarded. The lesions were excised completely as one piece by Diode laser 940 nm applies 1.4W Power, 100 milliseconds pulse duration with fiber optic delivery system. All patients had undergone the same surgical technique that achieved under local anesthesia (2.2 ml cartridge containing 2% lidocaine with epinephrine 1:80.000).

The lesions were cut carefully by moving the laser fiber tip in a sweeping motion on the surgical site to accomplish coagulation and prevent bleeding. The wounds were left without suturing for healing with secondary intention (Figure 1&2). Thereafter, 10% formaldehyde solution was utilized to preserve the specimens for histopathological investigation.

All the specimens were undergo a standard tissue processing procedure subsequently the paraffin embedded blocks were sliced in 5µm thickness into a clean glass slide and prepared to H & E staining and all slides were examined using light microspore. Cephalexin (250mg -500mg) and paracetamol (500mg) as analgesic (if necessary) were given to the patients postoperatively; the dose was determined according to the age and weight of each patient, each patient was motivated to enhance their oral hygiene practice by Listerine mouthwash with softly brushing, mushy food were recommended and all cases were followed up for about 3 days then after 1-2 weeks to assess the healing process and keep follow up for 6 months to reveal any possibilities of recurrence. For the study, all patients were requested to revealed opinion and complete the questionnaire chart and digital photos for documentation.

Results

A total of 54 patients (14 female & 40 male) have been enrolled in this study undergon surgical excision of pyogenic granuloma aged from 8 to 53 years old (mean age= 27 years) with the peak incidence of occurrence (44.5 %) in the (11-20 years) age group. Pyogenic granulomas were most occur in male (74%) than female (26%), the male : female ratio was 3:1 .(Table 1)

Regarding site of the lesions, upper gingiva was the most frequently involved in 18 cases (34%) followed by lower gingiva in 14 cases (26%), tongue and buccal mucosa were equally involved in 6 cases (11%) while palate and lower lip were equally involved in 4 cases (7%) whereas the least occurrence site was upper lip in 2

cases (4%). . In general the lesions manifested as smooth, painless masses, pedunculated or sessile, red to reddish-purple in color depending on duration of the lesion that often bleed easily because of vascular intensity. Most of the collected cases had intact surface 42 cases (78%) and ulcer was present in 12 cases (22%) and varied in size from 5mm - 3cm . (Table 2)

Histopathological examination reveals highly vascular proliferation tissues admixed with numerous blood vessels enriched with red blood cells, non-lobular pattern was seen in 48 (89%) while lobular pattern seen in 6(11%), diffuse inflammatory cells infiltrate found in both pictures. The intervening fibrous stroma is infiltrated with inflammatory cells and large collagenous bands seen in aged lesions. The surfaces were mostly non-ulcerated stratified squamous epithelium with hyperplasia and ulcerated surfaces were coated with fibrinoid necrosis (Fig. 3&4). Diode laser application given optimum integration of hemostasis and clean tissues cutting. The patients were satisfied and comfortable with the procedures. The wounds were completely healed within 10-14 days after surgery and no post-operative complications were observed.

Table-1. Age & Gender Distributions

Age group	Gender		N (%)
	Male N (%)	Female N (%)	
0-10	2 (4%)	0 (0%)	2 (4%)
11-20	14 (26%)	10 (19%)	24 (45%)
21-30	4 (7%)	2 (4%)	6 (11%)
31-40	10 (18%)	2 (4%)	12 (22%)
41-50	6 (11%)	0 (0%)	6 (11%)
51-60	4 (7%)	0 (0%)	4 (7%)
Total	54 (100%)		

Table-2. Site & Appearance Distributions

Site of the lesion	Appearance of the lesion		N (%)
	Ulcerated mass	Mass	
Upper gingiva	2 (4%)	16 (30%)	18 (34%)
Lower gingiva	4 (7%)	10 (19%)	14 (26%)
Palate	0 (0%)	4 (7%)	4 (7%)
Tongue	2 (4%)	4 (7%)	6 (11%)
Lower lip	1 (2%)	3 (5%)	4 (7%)
Upper lip	1 (2%)	1 (2%)	2 (4%)
Buccal mucosa	2 (4%)	4 (7%)	6 (11%)
Total	54 (100%)		

Figure 1 Preoperatove View

Figure 2 Postopertative View

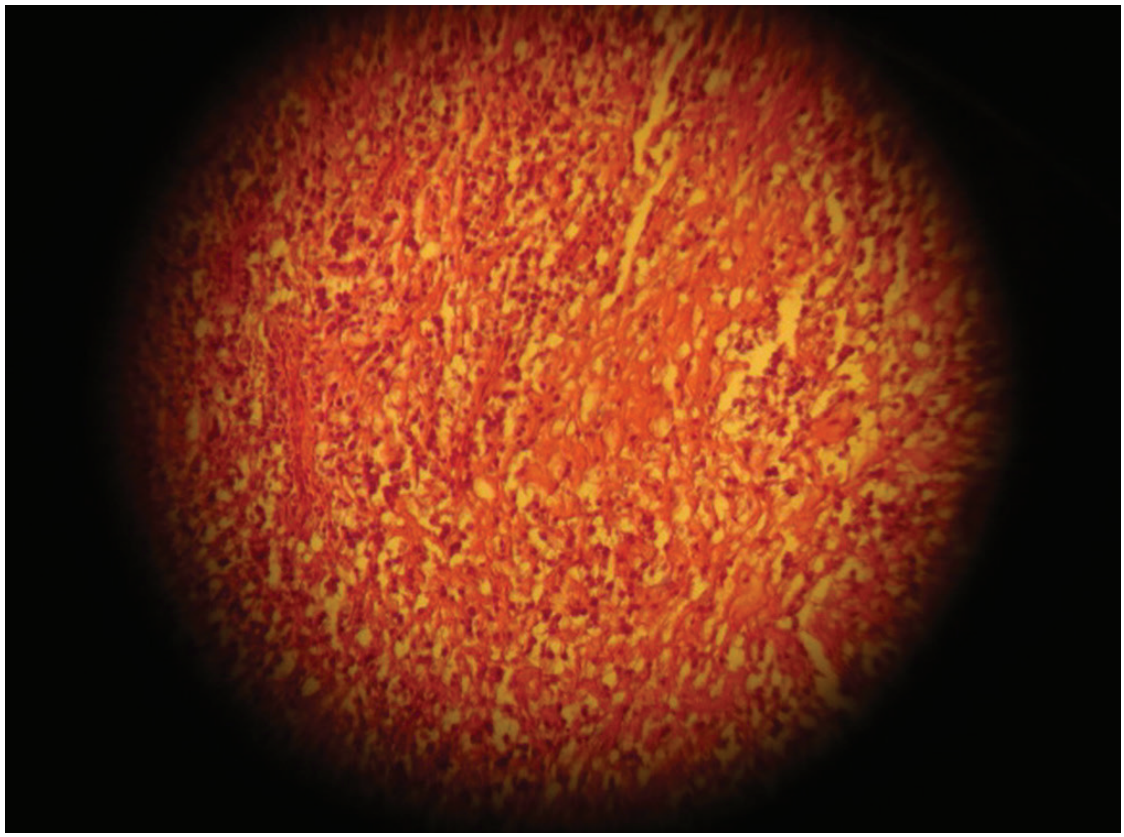

Figure 3 (10X) Histopathological View.

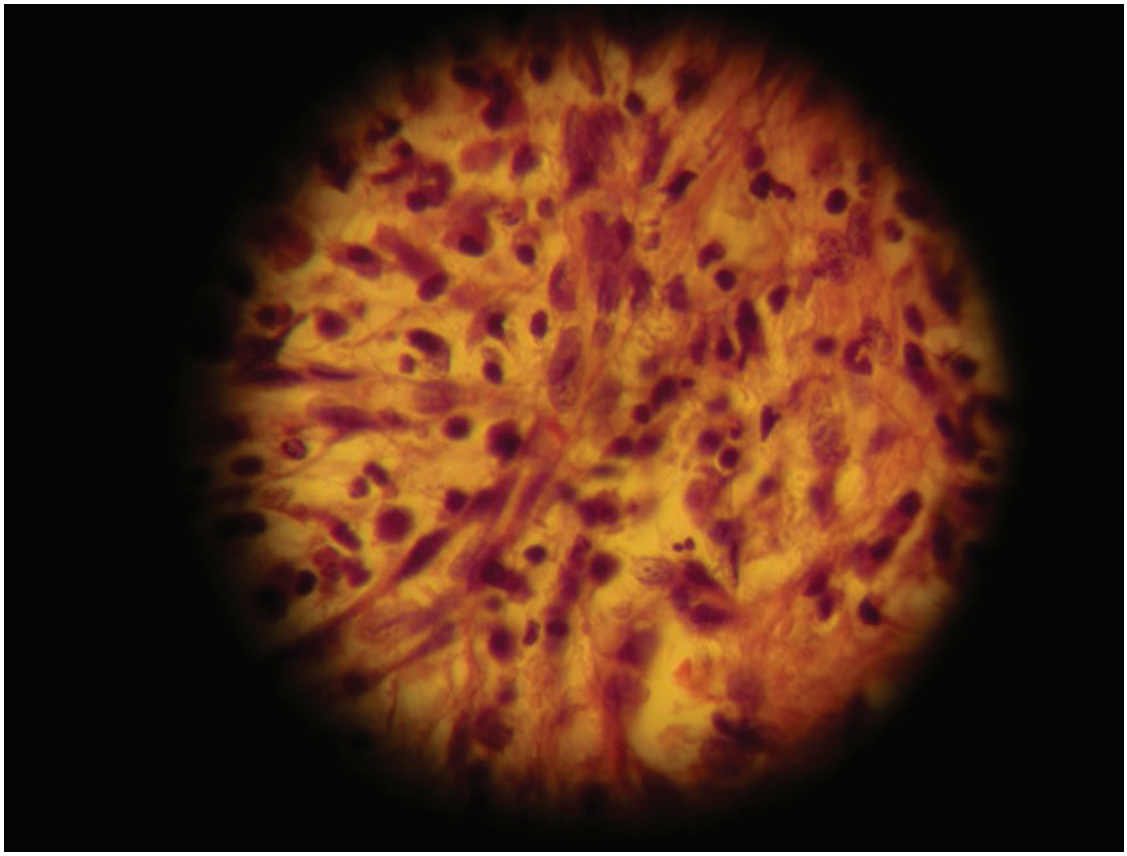

Figure 4 (40X) Histopathological View

Discussion

Oral pyogenic granuloma can be evolved in any decades of human life. The current study revealed that the second decade was the most affected age group (45%) [13,14,15]. Although most of the researchers reported that females were highly affected by oral pyogenic granuloma in relation to males but our finding on the contrary, the male:female ratio was 3:1 and this difference was attributed to diversity in sample collection and nomadic factor associated with neglecting oral hygiene that resulting to calculus accumulation, trauma and oral tissues deterioration by promoting gingival inflammation [14,16,17,18]. Our clinicopathological study declared that maxillary gingiva was commonly affected site [1,13,14]. Clinically, most of collected cases presented as mass [10,16], where the surface of the lesion becomes ulcerated with pedunculated base. Short duration oral pyogenic granuloma much more easily bleed as a result of less collagen fibers as well as high vascularity; in contrast the older lesion have more collagen and less vasculature[18,19].

It is important to mention the clinical presentation of oral pyogenic granuloma during pregnancy was similar to non-pregnant. The socioeconomic status and oral hygiene practice play an important role in the up growth of the lesion in this clinicopathological trial, as urban people less complaining from in comparison to rural residents.. The size of the lesion of oral pyogenic granuloma in this clinicopathological study was ranged from (0.5 – 2.5) cm in diameter, the small lesions arise within (7–21) day; while the larger sized lesion need a much more time (4–6) month which give indication about the growth of oral pyogenic granuloma was grow slowly [14,18,20]. Simple surgical excision by diode laser 940nm bonded to the lesion base of the oral pyogenic granuloma including about (2 mm) of the surrounded healthy tissue and curettage deeply up to bare bone was applied by precised roots planning of the surrounded teeth to ensure causative agents removal i.e. retained roots, overhanging filling and calculus. Follow-up of treated patients is mandatory to ensure there were no chances for recurrence in operated cases. Recurrence was attributed to inadequate lesion removal as well as causative agents' persistence [14,15,16]; and thus; (2 mm) of the surrounded normal health tissue was ablated to have good prognosis.

Etiology of oral pyogenic granuloma is still not very clear but it has been concluded that it is considered to be a reactive lesion to multiple low-degree irritation or stimuli i.e. aggressions, repeated trauma, hormonal factors or even certain drugs and there is increased incidence during pregnancy is attributed to raised levels of progesterone and estrogen [1,3,6] .

Histopathological examination of the ablated oral pyogenic granulomas showed infiltration of vascular granulation tissue by inflammatory cells and macrophages, i.e distinguished vascular growth suggesting angiogenesis of a strong performance that may develop at any age but are more frequently seen in adolescents and young adults as well as current study showed no radiographical sign of bone resorption linked to lesion growth[,2,5,6,9,11].

Oral pyogenic granuloma is a non-neoplastic tumor growth that affects oral tissues. It is considered as one of the most common type of hyperplasia in oral cavity. Histopathological examination of the ablated lesions were in harmonies with hyperplastic inflammatory lesions that have granulation tissue proliferation with inflammatory infiltrate with increases angiogenic capacity; for that, vascular neoformations of assorted diameter are normally raised which exhibit abrupt onset and completion within the tissue with no sign of bony resorption linked to the lesions[9,10,19,20] The laser is a rapidly developing technology that become a much standard tool in removal of oral pathological lesion. Hence, it becomes important for the surgeon as well as the pathologist to acquire knowledge about it applications more effectively and efficiently.[17,22,23]

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