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Oral plasma cell mucositis: a histopathological point of view

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OBJECTIVES

- Oral plasma cell mucositis (o-PCM) is a rare, inflammatory, benign disease histologically characterized by dense infiltrate of mature plasma cells with formation of Russel bodies.
- O-PCM is commonly considered idiopathic disorder, although hypersensitive reactions to certain types of antigens have been proposed regarding its onset.
- To regard the pathogenesis, chronic inflammatory modifications could lead to loco-regional immunological dysregulation and could induce plasma cell migration with pro-inflammatory cytokines.
- Clinical features of o-PCM range mainly from erythematous and/or edematous lesions to erosive and/or ulcerative lesions.
- The aim is to retrospectively report our histological findings on O-PCM patients enrolled in Oral Medicine Unit at Federico II University of Naples from 2000 until 2022.

METHODS

- This was a retrospective observational study on o-PCM patients carried out at Oral Medicine Unit, Federico II University of Naples, from 2000 until 2022.
- A medical chart review of all patients with a confirmed diagnosis of o-PCM was conducted by two independent oral medicine specialists.
- Data regarding histological findings were retrieved from the electronic database of the Department of Advanced Biomedical Sciences, Federico II University of Naples.
- For each patient, an incisional biopsy was performed, and each specimen was placed in 10% buffered formalin solution for fixation; paraffin-embedded material was cut into 4 µm-thick sections and stained with hematoxylin/eosin for routine histological examination using an optical microscope (Model Olympus CX41RF, Olympus Corporation, Tokyo 163-0914, Japan) at magnifications of 40× and 100× by a general pathologist.
- In cases of bullous, erosive, or ulcerative phenotype, direct immune-fluorescence microscopy (DIF) was made to detect deposits of Igs-G, Igs-A, Igs-M, C3, and fibrinogen, and an ELISA test was performed to detect antibodies against Desmoglein 1 and 3, BP 180, and BP 230.

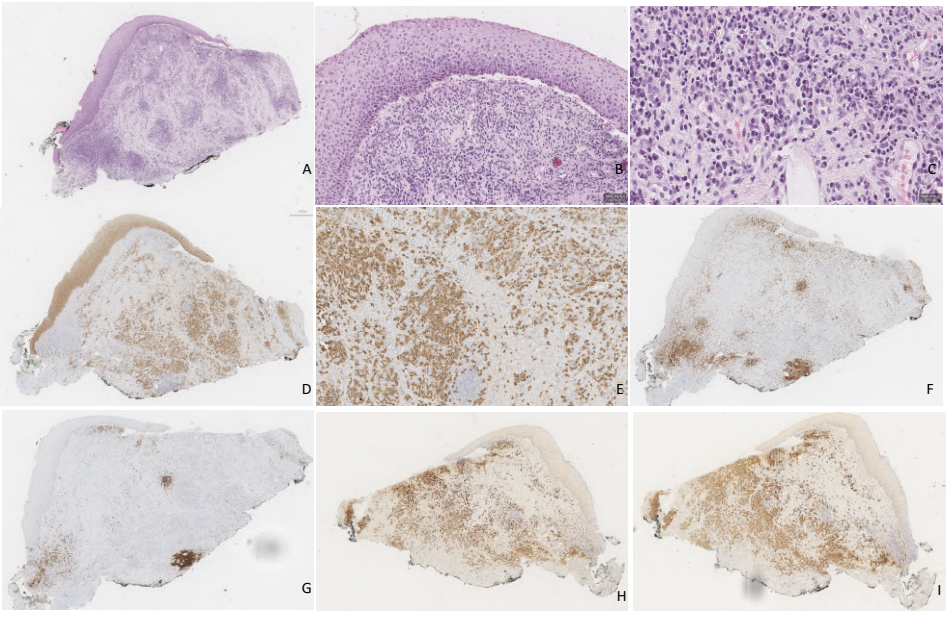

Figure 1. Histological examination revealed a mucous biopsy lined by hyperplastic, para-keratinized stratified squamous epithelium with a dense plasma cells-rich infiltrate in the submucosa (A-B, H&E 2, and 10x respectively). A high-power view showed a population predominantly composed of mature plasma cells (C H&E, ×20). Neoangiogenesis was also present (B). The immunohistochemical evaluation confirmed the prevalence of plasma cells (CD138+) in the inflammatory infiltrate (D-E, CD138 IHC 2x and 20x respectively) and highlighted a small proportion of Lymphocytes T (CD3+, figure F) and B (CD20+, figure G). Kappa and Lambda chains were equally expressed (Figures H and I respectively).

RESULTS

Tables 1. Main histological features of O-PCM

Histopatological features	Frequency N (%)
Sub-epithelial features	
Dense plasma cell-rich infiltrate	110 (100)
Lymphocytes	52 (47.3)
Eosinophils	20 (18.1)
Neoangiogenesis	11 (10)
Monocytes	6 (5.4)
Fibrosis	3 (2.7)
Edema	2 (1.8)
Dilated capillaries	1 (0.9)
Neutrophils	1 (0.9)
Micro-abscesses	1 (0.9)
Epithelial features	
Epithelial hyperplasia *	19 (17.3)
Athrophy	13 (11.8)
Parakeratosis	6 (5.4)
Acanthosis	5 (4.5)
Exocytosis	2(1.8)
Acantholysis	1 (0.9)

- We included 110 patients, 34 (30.9%) males and 76 (69.1%) females with a median age of 63.6 years: of these, 67 (60.9%) had vesicolo-bullous phenotype (BO-PCM).
- At histological examination all samples showed a dense inflammatory infiltrate predominantly composed by plasma cells. (Table 1). In a small proportion of cases a mixed inflammatory infiltrate was found.
- Dysplasia was detected in 24 specimes (Table 2.)
- Immunohistochemical evaluation (IHC) of Kappa and Lambda was performed in 15 samples (13.6%). Of these, a normal ratio of kappa and lambda expressing cells was reported in 12 (80%) patients, a predominance of kappa and lambda light chain expression is identified in 3 (20%) and 1 (6.7%) samples, respectively.
- In 50(74.6%) patients with BO-PCM DIF was performed. Of these, 3 specimens (6%) were found to be unsuitable, 18 (36%) were found to be negative and 29 (58%) were found to be positive (Table 3).

Tables 2. Analysis of dysplasia in O-PCM

	Dysplasia					
	Mild		Moderate		Severe	
	Gingiva	Other sites	Gingiva	Other sites	Gingiva	Other sites
BO-PCM (14 pts)	3 (21.4%)	6 (42.9%)	3 (21.4%)	1 (7.14%)	-	1 (7.14%)
O-PCM (10 pts)	1 (10%)	3 (30%)	2 (20%)	3 (30%)	1 (10%)	-

Tables 3. Analysis of DIF in BO-PCM

	Frequency N (%)
IgG	
Intercellular deposits	12 (24)
Deposits in the stromal area	5 (10)
IgA	25 (50)
IgM	5 (10)
Fibrinogen	6 (12)
C3	6 (12)

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CONCLUSIONS

- In the description of the white cell series, lymphocytes prevail, followed by monocytes and eosinophils.
- Epithelial hyperplasia, atrophy, acanthosis, and parakeratosis, may be present.
- A possible explanation of the evidence of mild/moderate dysplasia can be attributed to locoregional reactive inflammatory processes, while the evidence of the two cases with severe dysplasia remains completely unknown.
- In the bullous phenotype, histological analysis showed only subepithelial detachment; DIF resulted positive mainly for Igs-A and Igs-G in the stromal area and intercellular deposits of Igs-G.
- In all the blistering types of our group, ELISA tests for the major antigens commercially available were negative, allowing to rule out the diagnosis of AMBDs.