

Adumbrating the relation of oral and Gastro-intestinal System

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Abstract:

Severe diseases and genetic susceptibility of an individual may cause the oral bacteria to colonize in the gut. There might be dysbiotic oral microbiota that could cause this. Maintaining a good oral hygiene, proper periodontal therapy etc. could aid in reducing systemic presentations and also prevent systemic inflammatory diseases. Various conditions have shown different oral manifestation which helps the health professional to identify and manage the disease. A comprehensive literature search was performed on PubMed Library covering the years 1981-2018 for articles addressing the defined clinical question. Only studies that fulfilled the inclusion criteria of relevance to gastro-intestinal diseases and oral cavity, with clinical and microbiological success rate were included. The results indicate the development of research, clinical application of gastrointestinal systems and its oral manifestations. There is an array of gastrointestinal conditions that differ from each other in relation to appearance in the oral cavity, which provides more insight to the health care workers to identify possible gastro-intestinal conditions with oral examination or findings that could facilitate proper referral.

Key Words : Gastro-intestinal, Oral, Periodontal, Diagnosis, Referral

Introduction :

The oral cavity is a region that is most commonly affected whenever there arises any condition that affects the gastro-intestinal tract. It is occasionally possible to identify gastrointestinal (GI) disorders as having symptoms in the form of lesions in the jaws, oral mucosa, or perioral tissues. The oral lesions may occasionally appear before the onset of GI disease, be present during the disease process, or continue long after the sickness has disappeared. Oral changes can sometimes be a result of systemic changes brought on by GI disease, such as those related to malabsorption, while other times they are caused by lesions that are distinct from GI lesions. The oral abnormalities seen in a few GI disorders are reviewed and shown in the current work.^(1,3)

The establishment of a differential diagnosis for individuals with GI complaints may benefit from oral presentations of GI disorders, and oral tissues may provide a simple biopsy site for ailments like Crohn's disease. In other cases, the presence or amount of oral symptoms can be used to monitor the disease's severity or prognosis, and the way that GI disorders are managed may reflect how well oral tissues respond to that care.^(2,3)

Methods :

A comprehensive literature search was performed on PubMed covering the years 1981-2018 for articles addressing the defined clinical question that stated the reason and the relevance of relation of oral cavity, its various presentations

and link to gastro-intestinal diseases. Two authors separately assessed the title and abstract, and any disagreements were settled in conversation with the third author. This study only included papers that compared and explained the various gastrointestinal illness categories, their severity, consequences for the oral cavity, and clinical symptoms. Included studies reported the clinical and microbiological success rates. The data from primary sources was tallied by the writers.

Results :

Crohn's Disease: - In case of the oral lesions seen in Crohn's disease, they might be present for a long time or relapse over years. The response to systemically administered therapy changes and is unpredictable, and might not exactly occur parallel to the progression of the gut disease. The oral ulcerating lesions might require corticosteroid therapy, mainly topical or even intra-lesional injections. It was reported that two cases developed intraoral adhesions.^(2,3)

Ulcerative Colitis: - Oral manifestations and lesions of ulcerative colitis is called as pyostomatitis vegetans – are very rare. The oral lesions and manifestations may occur at any time, irrespective of any age. The oral lesions occur prior to GI lesions. Clinically, the lesions may appear as scattered, clumped or linearly placed and/or oriented pustules on an erythematous mucosa, but it appears that it usually spares the dorsum of the tongue. The amount of discomfort faced by patient is proportional to the degree and extent of ulceration

of the lesions, many of which remain epithelialized. Lesions with extended duration may become granular, polypoid or fissured, clinically mimicking Crohn's disease while few people may develop inflammatory bowel disease-associated arthritis of the temporomandibular joints.

The clinical assessment and information received based on history, must be analysed microscopically; asymptomatic patients receiving a diagnosis based on the above factors, of pyostomatitis vegetans should be investigated by a gastroenterologist for the type of bowel disease.^(3,4,5)

Gardner's Syndrome: - Gardner's syndrome is associated with a lot of other organ systems, it may affect various regions like the skin, skeleton and soft tissues⁽⁴⁾

Possible head and neck manifestations of Gardner's syndrome may include the following, most of which begin in childhood or adolescence^(3,6), that are:

- Multiple enostoses of the jaws;
- Supernumerary and/or unerupted teeth;
- Increased risk of odontomas;
- Osteomas of the jaws and paranasal sinuses; and,
- Epidermoid cysts of the skin of the head and neck.^(3,6)

Peutz-Jeghers Syndrome: - In Peutz-Jeghers syndrome oral/ perioral pigmentation might develop, which develops in childhood. Freckling of the skin might develop around the vermilion zone of the lips. Intraorally, the lesions are usually flat, painless, brown pigmented patches of the buccal mucosa, tongue or labial mucosa.^(3,7)

Malabsorption Conditions: - The common malabsorption conditions include iron malabsorption due to iron deficiency anaemia and vitamin B₁₂ malabsorption in pernicious anaemia. Various presentations include atrophic glossitis, in which the filiform papilla and fungiform papilla of the dorsum of the tongue undergo atrophy, leaving a bald, red tongue. The atrophy might involve just a few regions in mild cases, but more severe cases show involvement of the entire dorsum of the tongue. In very severe cases, it might be clinically resembling aphthous ulcers, that might be round to oval-shaped, persistent with bright red borders. Patient might complain of a burning sensation (glossopyrosis) that may precede oral lesions. The patients might develop angular cheilitis, a candidal infection treated with suitable antifungal medication.^(3,8)

Neoplasms: - Occasionally oral cavity and most commonly in the posterior mandible, is a site where metastasis occurs of GI tract and Liver neoplasms, which can be attributed to hematogenous spread. Patients with mandibular metastases may not exhibit any symptoms, or may complain of lower jaw pain or tooth ache, numbness or loss of sensation (unilateral

or bilateral) or associated with mobile teeth. The neoplasm might be sometimes found in a non-healing extraction socket after a tooth has been extracted because of mobility. Radiographically irregular, poorly circumscribed, multifocal radiolucencies may be visible. Metastases may involve the maxilla or other oral soft tissues, rarely.⁽³⁾

Certain oral bacteria contribute to both oral and gastrointestinal cancers. For example, *P. gingivalis* is associated with colon and gastric cancers along with being responsible for periodontitis. Certain studies have proved that individuals with periodontal diseases have more predisposition to such cancers.⁽¹⁰⁾

Jaundice: - In jaundice, the excess bilirubin in the blood induces a yellow discoloration. Thus its discoloration decides the concentration of bilirubin. The lingual frenum and the soft palate, are more severely affected due to increased affinity to elastin. In children, due to biliverdin deposition a yellow-greenish pigmentation occurs in the teeth of children with hyperbilirubinemia as teeth undergoes calcification, for example as seen in biliary atresia. In adults, as the enamel on the teeth has already calcified discoloration of the soft palate can be seen. Consumption of Vitamin A should be considered during clinical examination.^(4,10)

Liver Cirrhosis: - There is an association between liver cirrhosis and periodontal disease. The patients with non-alcoholic cirrhosis presented a tendency to have a greater clinical attachment loss (CAL) when compared with healthy volunteers, but not much of a significant difference was found in age groups.⁽¹¹⁾

These patients exhibited a poor periodontal status compared when with healthy control individuals. Patients suffering with cirrhosis for more than 3 years exhibited greater CAL, dental plaque and calculus than patients with less than 3 years of suffering with cirrhosis.⁽¹²⁾

This could be attributed to decreased blood flow at/of the muco-gingival junction or elevated levels of serum alkaline phosphatase poor periodontal parameters.⁽¹³⁾

But, the effect of periodontitis on LC has not been fully investigated. Therefore, more studies are required.

Gastric Reflux: - Clinical examination reveals loss of enamel over areas of the teeth due to exposure to the gastric contents. In patients suffering from bulimia, it is most severe on the inner surface of the maxillary anterior teeth wherein the eroded enamel appears to be smooth, shiny and hard. If it starts appearing yellowish it may be due to the underlying dentin and thus the teeth may become sensitive to temperature changes.

These presentations may be witnessed on clinical examination in patients with chronic gastric reflux conditions

such as gastroesophageal reflux disease, hiatus hernia, excessive wine drinking, chronic alcoholism and also in bulimia.^(3,14)

Tooth erosion occurs not only from endogenous acids but also from exogenous acids. Gastric reflux, regurgitation and aspiration may have significant adverse effects on the mucosa of the oropharynx, respiratory and oesophageal mucosa.^(15,16)

A recent systematic review found a median prevalence for tooth erosion in patients which was 24% with gastroesophageal reflux disease (GERD) and a median prevalence in adult patients of 32.5% for GERD who had tooth erosion.⁽¹⁶⁾

Dental professionals may be the first persons to diagnose the possibility of GERD, especially when it might be a case of “silent reflux.” This is important as its prevalence has increased over time in many countries.^(14,15)

Acid contact on the mucosa in the distal oesophagus (waking state) might induce increased salivary flow and swallowing mechanisms (primary peristalsis), oesophageal peristalsis (secondary peristalsis) to buffer the acid that is produced.⁽¹⁷⁾

Salivary flow is significantly reduced during sleep, but saliva secreted intermittently in response to oral and facial movements, such as chewing helps to lubricate the oesophageal mucosa which may be like a protective mechanism.⁽¹⁸⁾

An experimental study on healthy individuals has shown that when acid gets into the oesophagus during sleep, a brief period of swallowing reflex occurs, which also increases saliva flow.

Helicobacter Pylori: - Oral *H. pylori* could be seen in case of gastric reflux. *H. pylori* has been cultured from root canal samples and also from plaque samples.⁽¹⁹⁾

The presence of *H. pylori* in the oral cavity correlates with its presence in the stomach most often by PCR.⁽²⁰⁾

A study also suggest that untreated periodontal condition could increase the risk of becoming re-infected after *H. pylori* eradication.^(19,20)

Similarly, usage of antiseptic mouthwashes, appropriate periodontal treatment improves the condition of the patient having a pre-existing *H. pylori* infection.

It is therefore possible that *H. pylori* may be present in the oral cavity before colonizing the stomach and also that the stomach could be re-infected by *H. pylori* present in the oral cavity.

Conclusion: Oral findings of GI diseases may be useful to the gastroenterologist in formulating a diagnosis for patients with GI disturbances. Oral tissue can be used as a site of

biopsy which is much easier and less invasive than the GI investigations in few GI diseases. Oral findings are useful in diagnosis, prognosis and for the evaluation of treatment outcomes as well.

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