

REVIEW OF PAEDIATRIC ORAL AND MAXILLOFACIAL PATHOLOGY

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ABSTRACT

Introduction

In this study we discuss the stomatological diseases and lesions among paediatric population and analyse the literatures followed by delineating the advances in Oral and Maxillofacial pathology techniques.

Materials and Methods:

Data available in the public domain like research papers by individuals, case studies of individuals and groups, etc., Literature available in public domain with respect to lab reports and analysis carried out in various developed and developing countries.

Results:

Data analysis of various literatures shows that Relative Frequencies of Biopsy done for children and adults increased with age. 16 Lesions contributed for 70% of total biopsies.

Conclusion:

Most common diagnostic groups for lesions were salivary gland pathology.

KEYWORDS: *Paediatric, Oral, Maxillofacial, Head, Neck Pathology*

Article History

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INTRODUCTION

Oral and maxillofacial region exhibits soft and hard tissue lesions in relation to children and adolescents. Broad categories of oral and maxillofacial pathology include mucosal diseases, congenital anomalies, neoplasm and inflammatory lesions. A thorough and detailed assessment, followed by investigations, diagnosis and management in conjunction with parental counselling provides an excellent therapeutic protocol and better prognosis.

DETAILED REVIEW

Paediatric Dental Diseases

1. Introduction

- Oral diseases comprise that of occurring in the head and neck region^{1,2,3,4}.

2. Diagnosis

- Extraoral and intraoral assessment plays an important role⁴.
- Differential diagnosis forms an indelible part of the assessment⁴.
- Radiological and pathological investigations are mandatory.⁴
- **Radiographs:** X-rays help dentists to diagnose issues, like cavities, tooth decay, and impacted teeth. Dental X-rays have low radiation levels which are highly safe for children and adults. Risks with Digital X-rays are even lower.
- **Cone Beam Computer Tomography:** CBCT is an improvement over CT scan. More perfect in diagnosis and treatment planning and hence CBCT was introduced. CBCT technology provides a 3- Dimensional mode of viewing developed images thereby, enabling accurate location and boundaries of lesion of any anatomical region. CBCT not only can be used in surgical fields but also dental fields like endodontics, prosthodontics, and orthodontics for effective treatment planning and dental care⁴
- **Magnetic Resonance Imaging (MRI):** Soft tissue examination of head and neck region depends largely upon this noninvasive investigation⁴.
- **Ultrasonography (USG):** Sound waves play an important role in this mode of investigation modality to detect soft tissue abnormalities in the head and neck region⁴.
- **BIOPSY:** Surgical removal of pathological tissue along with limited normal tissue for examination forms the core of biopsy⁴
- **Excision:** Less than one centimeter sized lesions are suitable whereas clinically malignant may not be suitable for removal as these lesions may be wide and deep.
- **Incision:** Larger than one centimeter lesions are eligible for this type of biopsy either under local or general anesthesia
- **Exfoliative Cytology:** a layer of tissue is scraped for diagnosis and examination. If the tumour is irregular deep biopsy is performed.

3. Children

Infants showing intra-oral lesions may require detailed diagnosis and management. Different types of paediatric oral and maxillofacial lesions are as under;

- **Mucocele:** Mucocele is a bluish translucent well circumscribed lesion. It arises on the rupture of the excretory salivary gland resultantly mucin leaks to the surrounding tissues covered by a fibrous capsule. They may be whitish keratinized or normal. It commonly occurs in the retromolar region buccal surface and floor of the mouth as a Ranula. The recurrence is reduced by a proper treatment plan. The ratio of occurrence is 2.4:1000 people⁴.
- **Riga Fede:** It is a rare disease in babies having ulceration on the ventral area of the tongue or inner area of the lower lips. It is due to trauma to the soft tissue from an erupted infant tooth. It is also called sub-lingual traumatic ulceration⁴.

- **Ranula:** Ranula is a fluid filled collection of cyst that forms in the mouth under the tongue. It is filled with saliva that has come out of damaged salivary glands which are small glands around the mouth. The cysts are bluish⁴.
- **Dental Follicle:** They are fibrous sacs having developed teeth and Odontogenic organ⁴.
- **Odontogenic Cyst:** Rests of odontogenic epithelium are the main source containing vapour, liquid and solid in semi-consistency⁴
- **Central Giant Cell Granuloma:** Midline swelling across, painless and anterior mandible are the pathognomonic features⁴.
- **Epstein Pearls:** These are small cysts that appear in an infant's mouth looking like small white bumps. As described by Epstein, these cysts appear on the infant's gums or roof of the mouth. These are seen in 60-85% of babies⁴.
- **Bohn's Nodules:** Bohn's nodules are pearly white papules appearing on the alveolar ridge of neonates, over the dental lamina or may be remnants of minor salivary glands⁴.
- **Congenital Epulis of the Newborn:** Epulis cell tumour is a rare tumor in newborn babies. It arises from the alveolar ridge which may affect respiration or feeding. Congenital Epulis is removed with carbon dioxide laser⁴
- **Radicular Cysts:** It is a cyst occurring in the epithelial residues of the periodontal ligament because of inflammation, mostly due to the death of the pulp⁴.
- **Dentigerous Cyst:** Un-erupted tooth encircled with a collection of fluid leads to this cyst formation⁴.
- **Peri-Apical Granuloma:** It is inflamed fibrous tissue at the peri-apical part laterally along the tooth root of an infected tooth necrotic tooth. It comprises of granulation and scar tissue caused by inflammatory cells⁴
- **Ameloblastoma:** Ameloblastoma is a rare tumour that starts in the jaw, often near wisdom teeth or molars. It's made of cells from the enamel that protects the teeth. The tumour may cause pain or swelling and alter the symmetry of the face⁴.
- **Cleft Lip and Cleft Palate:** Surgeries are required to correct the defects⁴.
- **Periodontitis:** Periodontitis is a serious gum disease that damages the soft tissues mainly the gingiva of the upper and lower jaw. Periodontitis leads to the loosening of teeth. Periodontitis is common and easily preventable. it is usually due to poor oral hygiene. The development of periodontitis starts with plaque composed mainly of bacteria⁴.
- **Scarlet Fever:** This fever is diagnosed by fever, pharyngitis, and reddish exanthema. Streptococcal bacteria are the cause of scarlet fever. It spreads through coughing. Throat culture and rapid antigen test are the diagnosis tools⁴.

DATA ANALYSIS

Materials and Methods

Data analysis was done based on a diagnosis of biopsies for 16 major diseases of the paediatric population as discussed in the tables below. The anatomical sites are categorized into 8 types viz., lips, buccal mucosa, tongue, gingiva, mouth floor, intraosseous and others³.

Advances

Diagnosis techniques have improved development over the years. Some of the advances in this field are given below.

TREATMENT OF CRANIOSYNOTOSIS

Craniosynostosis occurs when the sutures close early resulting in abnormal brain and skull growth. Early closure of the sutures may also start pressure inside of the head which may change the appearance of the normal skull/bones. The treatment for craniosynostosis is surgery to improve the form and maintain pressure in the intracranial region thereby, blood loss is less and surgical time is reduced⁵.

DIAGNOSIS OF NEOPLASTIC DISEASES

In the past, pathologists achieved developments in neoplastic diseases for the recognition and categorisation of tumors through standard light microscopy and specific histochemical stains. The introduction of the electron microscope helped further morphologic information but the application was limited as it was expensive and also, the size of the operating unit and requirement of fresh tissue restricted its use.

The easy way of collecting tissues was improved further by fine needle aspiration biopsy. The analysis has also become digital. Labeled probes help to analyze nucleic acid sequences. Techniques practised in diagnosis and quantity of the nucleic acid content of cells inter-alia include filter hybridization, DNA in-situ or RNA in-situ hybridisation, measurement of argyrophillic nucleolar organizer regions called AgNOR, and cytometric flow analysis. Cellular proteins other than nucleic acids can be recognised by immune-histochemistry and Western blot techniques. The method of polymerase chain reaction (PCR) has added to the efficiency of the above techniques by providing nucleic-acid amplification during the process of testing.

The immunohistochemical markers are used to differentiate whether the tissue of origin is epithelial, neurogenic, myogenic, lymphoid, or metastatic⁵.

D PRINTING IN PAEDIATRIC ORTHOPAEDIC OSTEOTOMEIS

Three-dimensional printing technology is the recent advancement used in the field of dentistry⁵.

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