28. ACCURACY OF IMAGING AND CLINICAL METHODS IN THE DIAGNOSIS OF DENTAL CARIES

Author: Sorin Raducan

Scientific adviser: Vasile Zagnat, MD, PhD in Medical Sciences, Associate Professor, Department of Radiology and Imaging, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Introduction. Dental caries remain one of the most common causes of dental complications. Early diagnosis allows the prevention of orthodontic complications in temporary teeth, aesthetic problems caused by extensive coronal destruction, and functional disorders associated with occlusal imbalance, which may affect both the temporomandibular joint and the remaining teeth in the oral cavity. Delayed diagnosis of dental caries can therefore influence not only the physical condition of the patient but also the psycho-emotional state.

Aim of study. The aim of this study was to analyze comparative statistical data in order to better understand the role of radiological examination in the diagnosis of dental caries and to evaluate the accuracy of the methods used.

Methods and materials. This narrative review included articles published on the ScienceDirect, PubMed, and Google Scholar platforms. The search was performed using the keywords “bitewing radiography sensitivity specificity caries”, “interproximal caries diagnostic comparison bitewing periapical”, and “CBCT caries radiographic detection intraoral”. Eight sources published within the last ten years were selected using the filters “human studies” and “English language”. Studies reporting data on sensitivity, specificity, and diagnostic accuracy were included.

Results. The analyzed studies confirm the importance of clinical examination as the first step in the diagnosis of dental caries. It allows the identification of visible lesions but presents limitations in detecting interproximal caries or lesions beneath restorations. Radiological investigations such as CBCT, Bitewing, and periapical radiography are useful when visual access is limited, especially in class II and III caries according to Black or in recurrent lesions. CBCT may produce artifacts in the presence of metal restorations; however, in selected cases it can show high diagnostic accuracy. Due to its three-dimensional nature, CBCT can also provide a volumetric assessment of the carious lesion. Bitewing and retroalveolar radiography provide clear images of a limited area and are frequently used to evaluate specific regions. Digital techniques such as BW+ may further improve image quality.

Conclusions. Radiological examination increases diagnostic confidence and allows a more accurate evaluation of the extent of carious lesions, supporting a more precise treatment plan. CBCT is useful in selected cases requiring three-dimensional analysis, while Bitewing radiography remains widely used for evaluating interproximal lesions. The choice of imaging method should always be individualized and correlated with the clinical examination to ensure an accurate diagnosis.

Keywords. CBCT, Bitewing, Diagnosis of Dental Caries, interproximal caries.

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