

# MICROSCOPES IN DENTISTRY - OPEN THE THIRD EYE

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## ABSTRACT

Operating Microscopes have changed the way we practice Endodontics and other finer specialties of Dentistry. Magnification and Illumination has become the basic necessity in a day to day Dental Practice. In this article along with a brief history of magnification in Dentistry, the various advantages of incorporating operating microscope are discussed in a detail.

**Key words:** Operating microscopes, endodontics, magnification.

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## INTRODUCTION

Science is advancing in a fast pace, so is the practice of dentistry. What makes dentistry different now is the incorporation of newer gadgets and concepts, out of which magnification takes a prime role in helping the clinicians, see what we never saw before with our naked eyes. This article sums up the advantages what operating microscopes offer to Clinicians and why we should be incorporating it in our day to day practice.

## HISTORY

It was in 1673 that Anton Van Leevenhock, a Dutch scientist first saw and explained the red blood cells under microscope<sup>1</sup>. He was a self-taught man in science, with his single lensed microscopes explored the wonders of human body and introduced the science of medicine to a new field of microbiology. Later in the late 19th century, Carl Nylen, a Swedish Otologist used a monocular microscope for ear surgery in 1921. Gunner Holmgren developed a binocular microscope for microsurgeries in 1922<sup>2</sup>. Microscopes were introduced in Dentistry by

Dr. Harvey Apotheker and Dr. G.J. Jako in 1978 and published in 1981<sup>3</sup>. The use of microscopes in Endodontics was explained first by Carr in 1992.<sup>4</sup>

## ADVANTAGES OF USING A DENTAL OPERATING MICROSCOPE (DOM)

### 1. Seeing is Believing

Many cases can be better diagnosed and many procedures can be better done when we have an improved vision and magnification. Certain conditions like cracked tooth syndrome are better diagnosed with a DOM which we fail to pick up with other diagnostic aids



A crack extending from the mesial aspect of premolar is better seen and explained under a microscope which explains the shooting pain for this patient. Radiographs may not help in such cases.

## 2. Less fatigue to the eyes and better ergonomics

The eyepiece of the DOM works with the principle of telescope. That helps the operator to see his images at a distance which renders less fatigue to the eyes. Dental surgeons are highly prone for occupational disorders related to bad posture. DOM helps you to maintain the correct relaxing unstrained position for your spine and neck.

## 3. Better Documentation and communication

A high definition camera can be attached to the microscope which can record the videos and photographs of your procedures. This allows you to communicate better with your patients and referring dentists and also use these for your academic purpose and research.



A crack running under an old amalgam restoration was better diagnosed and explained to the patient with the help of a microscope.

## 4. Better surgical precision

The precision of surgery increases with magnification. Flaps are more accurately repositioned. Sutures are better positioned. Vital Pulp procedures are better managed.



Following an Ellis Class III traumatic injury to a central incisor, the coronal pulp is removed and bleeding arrested using a sterile paper point. Surgical precision is enhanced under microscope.

## 5. Improved treatment quality and patient satisfaction

With magnification, the precision what you attain leads you to better treatment quality and better patient communication with improved patient satisfaction.

## 6. Endodontic retreatment and management of complications

Management of post treatment endodontic disease has always been a challenge in specialty practice. DOM open a new dimension in managing these challenges related to calcified canals, open apex, ledges, perforation repair, removal of root canal obturating material and the management of separated instruments.



MTA packed at the root apex of a tooth with open apex.

## 7. Locating the fine and additional canals in Endodontics

Anatomical diversity has always been a challenge in Endodontics. The presence of canals at unexpected locations can be better seen and managed under magnification. The second mesiobuccal canals of a maxillary molar, the middle mesial canal of a mandibular molar are certain examples.



Second Mesio Buccal canal of a maxillary second molar is better managed under a microscope

#### 8. Better margins for prosthetic work

Marginal Integrity is the foremost requirement for the durability of any restoration. Good margins ensure healthy gingiva and less plaque accumulation around margins. It is important when we go in for fine procedures like crowns, laminates, inlays and onlays. Preparation, Impression and Bonding under microscopes ensure better marginal integrity.

Working under a DOM is an entirely different ball game. You need expertise, training and at the same time an open mind to incorporate the concepts of micro-dentistry. Good assistance with six handed dentistry and a good practice management is the key to have a successful microscopic practice.

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