Endodontics

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Introduction

Endo is a Greek word for "Inside" and Odont is Greek for "Tooth". Endodontic treatment treats inside the tooth.

Endodontics is the branch of clinical dentistry associated with the prevention, diagnosis and treatment of the pathosis of the dental pulp and their sequela. Thus we can say that the primary goal of endodontic therapy is to create an environment within the root canal system which allows the healing and continued maintenance of the health of the periradicular tissue.

Endodontics has been defined as art as well as science of clinical dentistry because in spite of all the factual scientific foundation on which the endodontic is based, to provide an ideal endodontic treatment is an art in itself.

History:

Toothache has been a scourge to humanity from the earliest times. Both the Chinese and the Egyptians left records describing caries and alveolar abscesses. The Chinese considered that these abscesses were caused by a white worm with a black head which lived within the tooth. The Chinese treatment for an abscessed tooth was aimed at killing the worm with a preparation that contained arsenic. The use of this drug was taught in most dental schools as recently as the 1950s, in spite of the realization that it was self- limiting and that extensive tissue destruction occurred if minute amounts of the drug leaked into the soft tissues.

Pulpal treatment during Greek and Roman times was aimed at destroying the pulp by cauterization with a hot needle or boiling oil, or with a mixture of opium and hyoscyamus.

At the end of the first century, it was realized that pain could be relieved by drilling into the pulp chamber to obtain drainage. In spite of modern “wonder drugs” there is still no better method of relieving the pain of an abscessed tooth than drainage.

Endodontic knowledge remained static until the 16th century when Pulpal anatomy was described. Before the latter part of the 19th century, root canal therapy consisted of alleviating pulpal pain, the injection of 4% cocaine as a mandibular nerve block was first reported in 1884, and 20 years later the first synthetic local anaesthetic, procaine, was produced.

Shortly after the discovery of X- rays by Roentgen in 1895, the first radiograph of teeth was taken. This further popularized root canal therapy and gave the treatment respectability.

About the same time dental manufacturers began to produce special instruments which were used primarily to remove pulp tissue or clean debris from the canal.

By 1910 root canal therapy had reached its zenith and no self-respecting dentist would extract a tooth. Every root stump was retained and a crown constructed. Sinus tracts often appeared and were treated by various ineffective methods for many years. The connection between the sinus tract and the pulpless tooth was known but no one acted upon it.

Modern Endodontics:

The re-emergence of endodontics as a respectable branch of dental science began in the 1930s.

Gradually, the concept that a "dead" tooth was not necessarily infected began to be accepted. Further, it was realized that the function and usefulness of the tooth depended on the integrity of the periodontal tissues and not on the vitality of the pulp.

Another important advance was the formulation of the "hollow tube" theory, which was later questioned in research using sterile polyethylene tube implants in rats. The tissue surrounding the Lumina of clean, disinfected tubes, which were closed at one end, was relatively free of inflammation and displayed a normal capacity for repair. When such tubes were filled with muscle contaminated with G-ve cocci, the inflammatory reaction was only severe around the openings of the tubes containing contaminated muscle. These findings changed the emphasis of the "hollow tube" theory; stress is now placed on the microbial contents of the tube. If the tube contains microorganisms then the potential for repair is far less favorable than when the lumen of the tube is clean and sterile. This situation is likely to be found in most root canals requiring treatment.

The concept that "apical seal" was important led to the search for filling and sealing materials which are stable, non- irritant and provide a perfect seal at the apical foramen.

In summary, the principles of modern endodontic treatment are:

***Clean*:** remove microorganisms and pulpal debris from the root canal system.

***Shape*:** produce a gradual smooth taper in the root canal with the widest part coronally and the narrowest part 1mm short of the apex.

***Fill*:** obturate the canal system with an inert, insoluble filling material.

Scope of endodontics:

The extent of the subject has altered considerably in the last 50 years. Formerly, endodontic treatment confined itself to root canal filling techniques by conventional methods, even endodontic surgery, which is an extension of these methods, was considered to be in the field of oral surgery. Modern endodontics has a much wider field and includes the following:

1- Diagnosis of oral pain.
2- Protection of the healthy pulp from disease or injury.
3- Pulp capping (both indirect and direct).
4- Pulpotomy (both conventional and partial).
5- Pulpectomy.
6- Root canal treatment of infected root canals.
7- Surgical endodontics, which include apicectomy, hemisection, root amputation and replantation.