

Review Article

EVOLUTION OF PERIODONTICS: AN INSIGHT INTO THE PAST

Seema Munjal and *Sumit Munjal

Department of Prosthodontics and Crown & Bridge, Dr. BR Ambedkar Institute of Dental sciences & Hospital, Hariom Nagar, Patna, Bihar

Department of Periodontics, Institute of Dental Studies and Technologies, Modinagar, Uttar Pradesh, India

**Author for Correspondence*

ABSTRACT

The specialty of Periodontics has a long history dating back to prehistoric written evidence. Ancient Indian and Chinese describe scurvy and advocate cleansing of teeth for health. On through the Greek and Roman civilizations, the ailments were described along with remedies and preventions for them. In the mid- 19th century, John Riggs's name was synonymous with periodontal disease and was the pre-eminent authority in the field. The rapid progress in Periodontology clearly owes a great debt to those who laid the groundwork for this edifice. The article attempts to review the past till the present in the field.

Keywords: *History, Rigg's Disease, Periodontics, Gingival*

INTRODUCTION

Today the profession of dentistry is looked upon by the public with respect and admiration. Yet many know nothing about the struggles that took place to advance the profession or the great contributions made by dentistry to human welfare. On March 6, 1840, the first dental college came up in the world at Baltimore and it was due to the efforts of Horace Hayden and Chapin Harris. The organization of American Dental Association (ADA) took place in 1859 in New York. However, the first independent full-fledged department of Periodontics was created at the New York University College of Dentistry in 1926. Since then, there has been the explosion of knowledge in Periodontics with implant dentistry, conscious sedation, tissue regeneration and other innovations.

The first dental healers were physicians, but by the middle ages the barber surgeons of Europe had specialized in the care of the teeth. The disease in various forms, have afflicted mankind since the dawn of history. Studies in paleopathology have indicated that destructive periodontal disease, as evidenced by bone loss affected early humans in such diverse cultures as ancient Egypt and early precolumbian-America (Chiranjeevi, 1989). It was stated by Dr. Isadore Hirschfeld in his classic work, *The tooth brush, its use and abuse*, that it was common for our Simian ancestors to use bits of straw as tooth picks (Ring, 1985).

History of the Profession

All well defined cultures mentioned gingival disease. These included Sumerians, Egyptians, Hindus, Chinese, Hebrews, Mayans and Etruscans (Figure 1, 2).

Greece

Theophrastus, a disciple of Aristotle, considered a virtue to shave frequently and to have white teeth. Under Roman influence, the Greeks learned to use a multitude of materials as tooth cleansers; pumice, talc, emery, ground alabaster, coral powder and iron rust. Hippocrates of Cos (460-377 BC), the father of modern medicine, believed that inflammation of the gingiva could be caused by accumulations of *pituita* or calculus, with gingival haemorrhage occurring in cases of persistent splenic malady (Shklar and Carranza, 2006). One of his *better-known dicta*. Nature is the physician of disease, to do good, or at least to do no harm, remains good advice even today. Ancient Greeks were ministered medically by the priests who traced their lineage to Aesculapias, the God of medicine. The daughters of Aesculapias were Panacea and Hygeia, both of whom have remained within the periodontal pantheon.

Romans

In one regard at least, upper class Roman outdid hygiene-conscious people of today. When guests were invited for dinner, they were provided not only with spoons and knives but also with elaborately

Review Article

decorated tooth picks of gold, often of which they took home with them. Celsus (25 BC – 50 AD) mentioned in his book about the ligation of loose teeth to stabilize them. It was Celsus who first used the term tartar to describe the concretions found on the teeth. He described surgery of the gums, which included the use of cauterly and lancet. He also described gingival massage using the toothbrush (Chiranjeevi, 1989). The Romans used a variety of dentifrices: namely eggshell, Stag's horn and burnt pumice stone.



Figure 1: A Mayan skull illustrating periodontal disease along with inlays of jade and turquoise



Figure 2: Early evidence of splinting in Phoenician civilization

Egyptians

The earliest documentation, *George Ebers Papyri* which has numerous references to both dental and gingival maladies (Gold, 1985) is preserved in the library of Leipzig University. Dating from about 1550

Review Article

BC, it is not an original work but merely compilation of many medical texts of still earlier times, some written as early as 3500 BC. Among the treatments cited is one to cure the throbbing of bennet blisters of the teeth in order to ease the tooth that gnaws into the upper part of the flesh.

Ancient India

The first mention of dentistry in ancient Hindu legend has the Ashwins, twin sons of the Sun, giving teeth to Pushan (Shklar and Carranza, 2006). Both Charaka and Susruta discuss proper deportment and the daily regimen through ayurveda, the science of life, giving special attention to oral cleanliness. The later stated that Early in the morning a man should leave his bed and brush his teeth (Shklar, 2003) and according to the former, the stick for brushing the teeth should be either astringent or pungent or bitter. One of its ends should be chewed in the form of a brush. It should be used twice a day, taking care that the gums not be injured. Following tooth cleansing, the tongue scraped with a portion of stick. The Acacia and Latifolia trees were also recommended as being among the best sources for chewsticks. The twig was about 20 cm long and 7 mm in diameter (Gold, 1985).

Ancient China (Figure3)

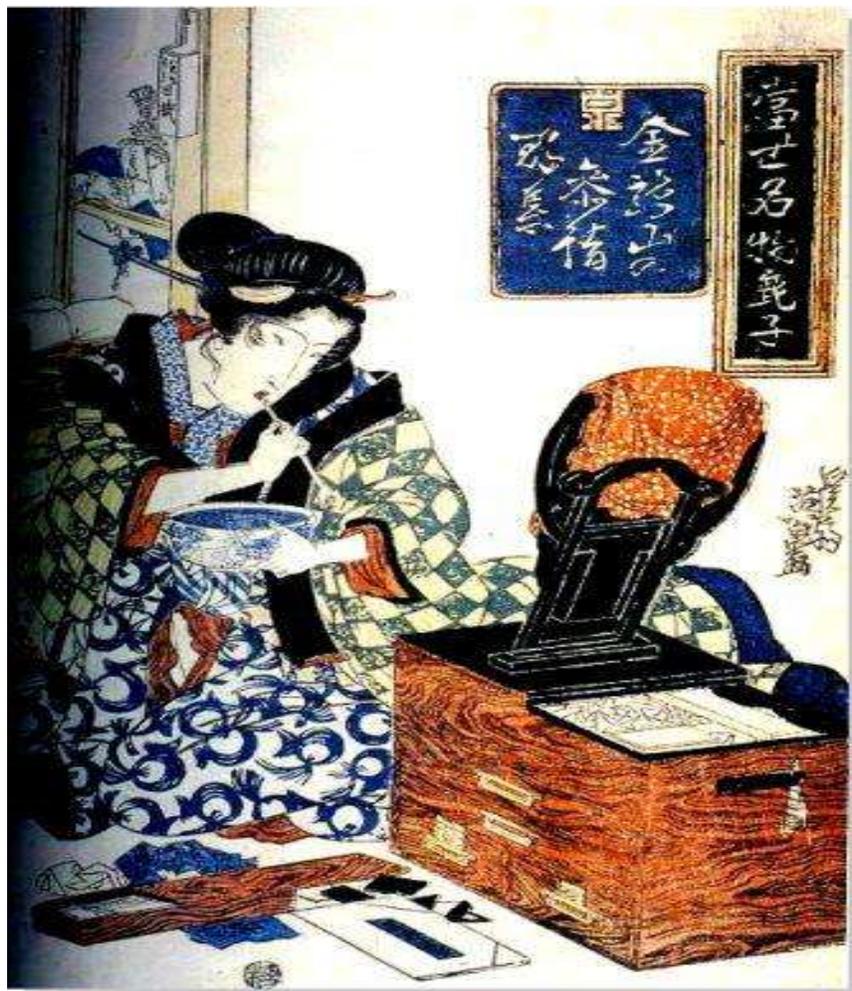


Figure 3: The evidence of first toothbrush in China

They were among the earliest people to use the chewstick as a toothpick and tooth brush to clean the teeth and massage the gingival tissues. The toothbrush as we know it today 'with the bristles perpendicular to the handle was invented by the Chinese in 1490's. Besides Chinese medical writings list 388 acupuncture

Review Article

points, 26 of which are for relief of tooth ache and of these 26, 6 are specifically for gingival maladies. According to Hwang – Ti (2500 BC), Oral disease-were divided into 3 types: (Shklar, 2003) Fong-ya or inflammatory conditions; Ya kon or disease of the soft investing tissues of the body; and Chong ya or dental caries

Arab Medicine (Islam) (Figure 4, 5)

Albucasis (936-1031) was considered the greatest surgeon of Arabia school. His works included illustrations of instruments specifically designed for dental procedures, including illustrations of both scalers and small surgical knives (Shklar and Carranza, 2006). For removal of epulis, the lesion was retracted with rakes or forceps and cut away down the roots. The wound was then cauterized with an haemostatic. In the event of recurrence, the lesion was resected with wider margins and the red-hot cautery used. Avicenna (1013-1037) (Shklar and Carranza, 2006) wrote a comprehensive treatise on medicine: *Canon*. Headings in the canon include ‘Bleeding gums’, ‘Fissures of the gums’, ‘Ulcers of the gums’, ‘Separation of the gums’, ‘Recession of the gums’, ‘Looseness of the gums’, and ‘Epulis. He stressed the importance of keeping the teeth clean and thus recommended meerschaum, burnt hart’s horn, salt and burnt powdered snail shells.

The prophet also recommended cleaning the teeth with a miswak (Figure 11) a twig of the *Salvadora perca* tree, whose wood contains sodium bicarbonate and tannic acid as well as other astringents that have a beneficial effect upon the gums (Chiranjeevi, 1989). It is said that Muhammad was so fond of cleaning his teeth that he asked for his siwak on his deathbed and expired a few minutes later.

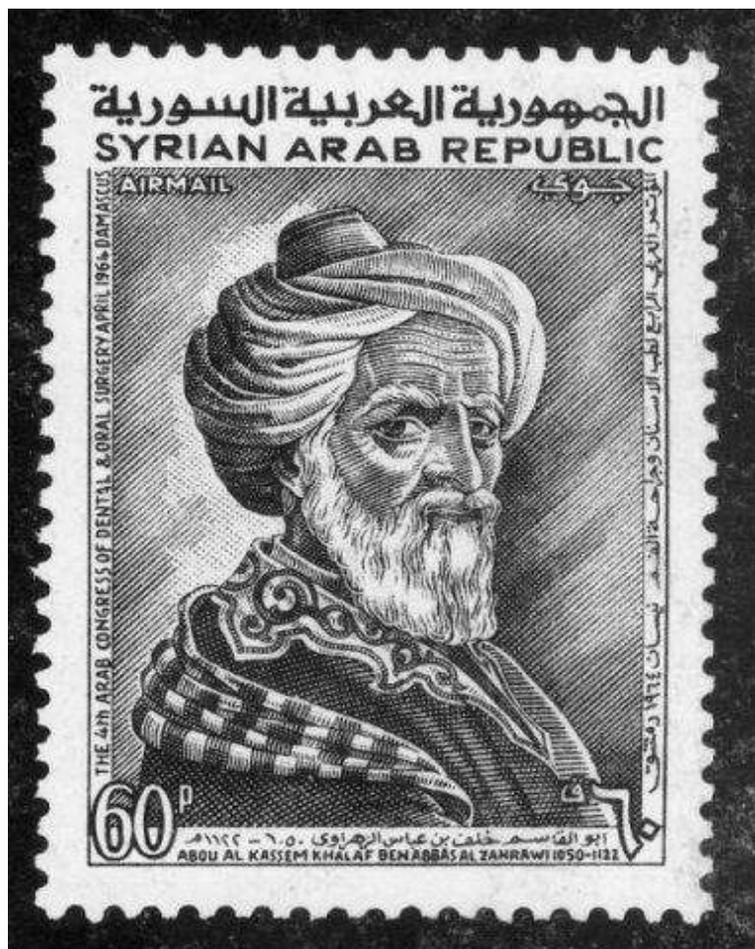


Figure 4: Albucasis, one of the greatest tenth century Arabic pioneer In Periodontology

Review Article

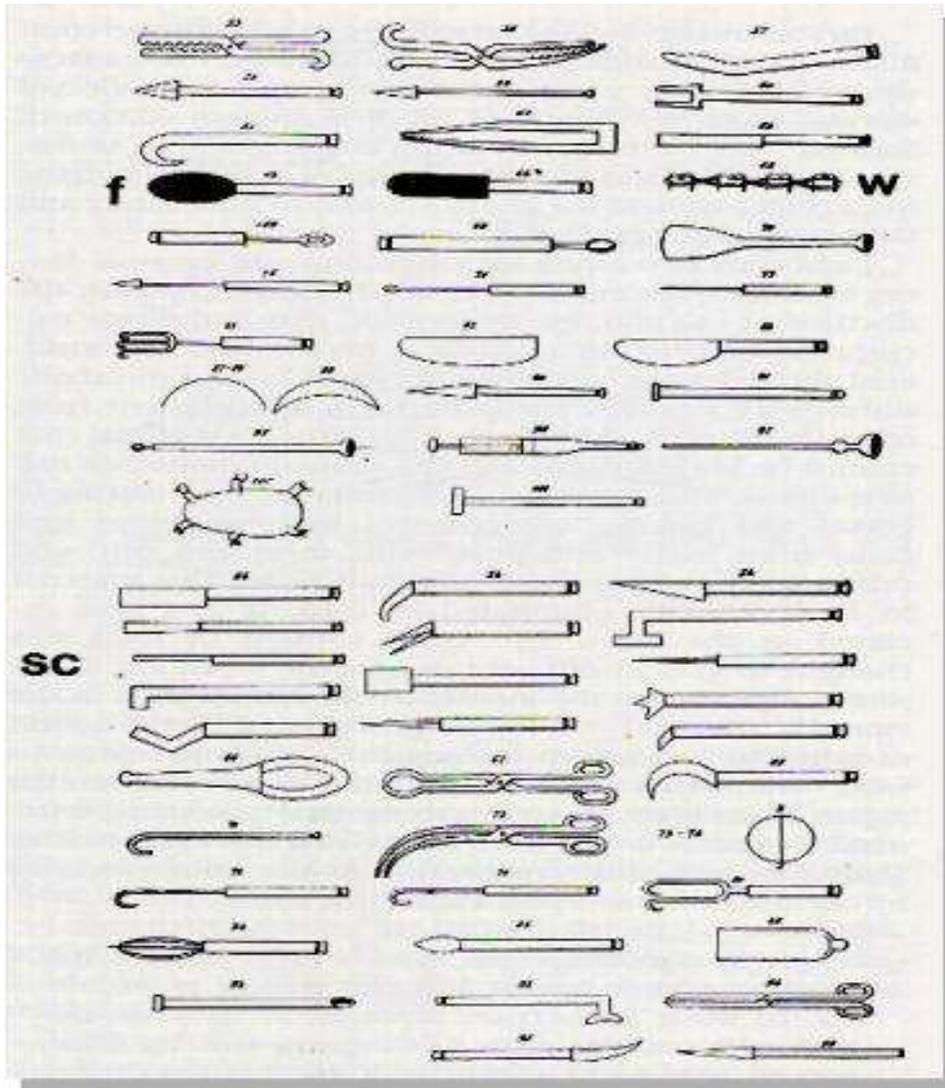


Figure 5: Illustration of Albucasis's periodontal instruments

The Middle Ages & modern Periodontics (Figure 6)

With the European Renaissance, significant advances were made in medicine and dentistry. Ambroise Pare (1510-90), one of the great surgeons of the 16th century introduced the ligation of blood vessels into amputation procedures. He accurately recorded the number of roots of various teeth and described their attachment to bone via a fibrous ligament. Pare and Albucasis both described replantation. It was not until the time of Pierre Fauchard in the 18th century that codification of dentistry as a separate discipline would emerge (Shklar, 2003). Van Leeuwenhoek, in the 17th century described the oral microflora as “animalcules” found in scrapings from between the teeth using his primitive microscope. He enjoys a niche in the history of science that remains unchallenged after three centuries (Chiranjeevi, 1989). In spite of the significant progress in morphologic descriptions of micro-organisms, firm establishment of the *germ theory of disease* was only accepted after the pioneering work of Pasteur, Koch and Lister (Gold, 1985). The standard for identifying the causative agents of infectious disease and are collectively known as *Koch's postulates*. The generally prevailing view was that the bacterial plaque complex responsible for causing periodontal disease was essentially an overgrowth of micro-organisms indigenous to the oral cavity as described by Loe *et al.*, (1965). In contrast, Socransky and others have identified specific microorganisms as etiologic agents in specific forms of periodontal disease (Gold, 1985).

Review Article

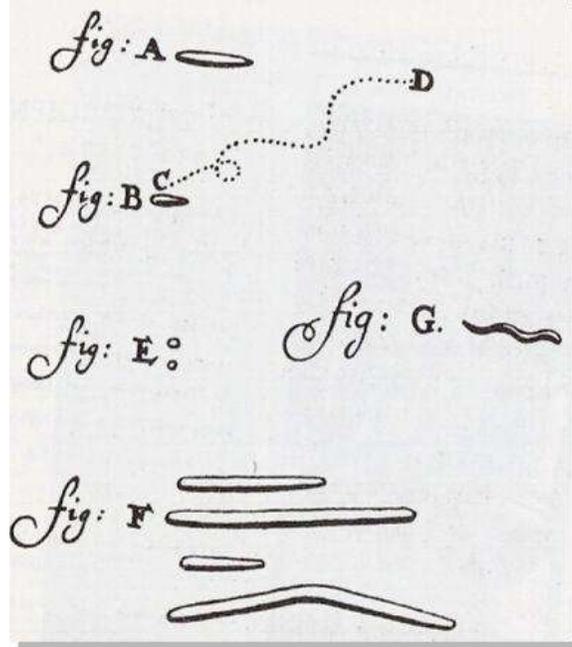


Figure 6: Leeuwenhoek's drawing of animalcules

Periodontal Surgery

In the 1920's controversy centering on the priority of periodontal flap surgery involved Cieszynki, Widman and Neumann, each claiming to have been the first to report. The development of a reliable local anaesthetic in 1905 with the work of Einhorn and Uhfelder on the synthesis of Procaine and the discovery of the X-ray by Roentgen in 1895 led to further advances. Robiscek popularized the gingivectomy procedure combined with the curettage of bony lesions (Stern *et al.*, 1965). This evolution was repeated in the US by the work of Orban, Glickmann, Goldman, Prichard and Schluger three decades later. The principles of successful operative procedures, according to Neumann, were: complete removal of concretions on the root and granulation tissue, especially in bone niches; transformation of vertical bony defects into horizontal atrophy; and the removal of gum pockets by carrying of "pituitous tunicle" (mucoperiosteal flap) up to healthy bone structure (apical positioning of flap) (Gold, 1982). Whereas Neumann always recommended provisional splinting prior to surgery but Widman felt that it interfered with his surgical approach and only stabilized the teeth postsurgically. Ramfjord and Nissle, concerned about bone tissue preserving, obtained a perfect closure of the flaps with minimal root exposure and modified the technique initially described by Widman (Ramfjord and Nissle, 1974).

The first use of pedicle or free tissue grafts to cover denuded roots is credited to M.P Younger. Harlan added the precaution that in order for this procedure of be successful "the tooth should not have a filling on the neck" and the neck of the tooth should be free from caries (Emslie, 1980). While Grupe and Warren pioneered the technique for lateral sliding of the flap with objective of correcting the gingival recessions in 1956; it is Bjorn who first described the free transplantation of gingiva in 1963. On observing the inherent problems with the above mentioned procedure, Langer and Langer introduced new concepts, indications and procedures with objective of covering root surfaces and enlarge bands of attached gingiva combining a partial – thickness flap coronally positioned with subepithelial connective tissue graft (Langer and Langer, 1985). Since then, many predictable periodontal plastic surgical techniques have evolved.

DISCUSSION

Pierre Fauchard (Figure 7) developed a systemic approach to dental practice based on knowledge of this era. He recognized the relationship between oral hygiene and the etiology of periodontal disease. John.

Review Article

W. Riggs (Figure8) seems to have been the first individual to limit his practice to Periodontics and periodontitis or alveolar pyorrhea was known as *Riggs disease* in United States (Ring, 1985; Shklar and Carranza, 2006). It was assumed that the disease was related to religious practice and frequently blamed divine caprice or retribution for sin, illness or misfortune. According to an ancient myth, there were worms in the tooth which were visible on removal (Figure9). Dental education has evolved in the last two centuries, from a period of apprenticeship to a full-fledged university study with a sound basis of scientific research and technological advances (Ramfjord and Nissle, 1984). The Indian society of Periodontology, the only official organization for the field in India was founded in 1975 by Dr. G.B Shankwalkar and Professor M.S Ginwalla.



Figure 7: Pierre Fauchard, Father of modern dentistry

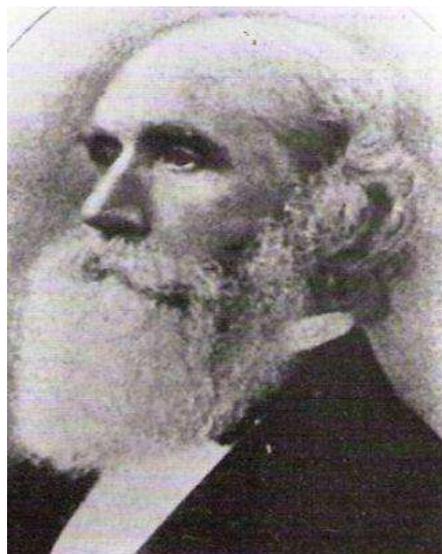


Figure 8: John Riggs, the first specialist in the field of Periodontics

Review Article



Figure 9: Worms in tooth, an ancient myth

CONCLUSION

The great Roman orator Cicero rightly said in the context *Not to know what has been transacted in former times is to continue always as a child. If no use is made of the labours of the past ages, the world must remain in the infancy of knowledge.* With the explosion of knowledge implant dentistry, conscious sedation, and other areas are inculcated in the curriculum and treatment has adopted an evidence- based approach.

REFERENCES

- Chiranjeevi K (1989).** History of Periodontology. In: *Periodontics for Postgraduates* 2-12.
- Emslie RD (1980).** A Century of British Periodontology. Centenary review. *British Dental Journal* **149** 3-4.
- Gold SI (1982).** Robert Neumann: A Pioneer in periodontal flap surgery. *Journal of Periodontology* **53** 456-459.
- Gold SI (1985).** Periodontics. The Past (I). Early sources. *Journal of Clinical Periodontology* **12** 79-97.
- Gold SI (1985).** Periodontics. The Past (II). The development of modern Periodontics. *Journal of Clinical Periodontology* **12** 171-189.
- Gold SI (1985).** Periodontics. The Past (III). Microbiology. *Journal of Clinical Periodontology* **12** 257-269.
- Langer B and Langer L (1985).** Subepithelial connective tissue graft technique for root coverage. *Journal of Periodontology* **56** 715-720.
- Loe H, Theilade E and Jensen S (1965).** Experimental gingivitis in man. *Journal of Periodontology* **36** 177-184.
- Ramfjord SP (1984).** Changing concepts in periodontics. *Journal of Prosthetic Dentistry* **52** 781-786.
- Ramfjord SP and Nissle RR (1974).** The modified Widman operation. *Journal of Periodontology* **45** 601-607.
- Ring ME (1985).** The Ancient near east. In: *Dentistry. An Illustrated history* (The Mosby Co., St. Louis) 27-33.
- Shklar G (2003).** The Prehistoric era and early civilizations. In: *History of Periodontology* edited by Carranza FA and Shklar G (Quintessence publ. Co. Inc. Chicago) 3-19.
- Shklar G and Carranza FA (2006).** The Historical background of Periodontology. In: *Carranza's Clinical Periodontology* 10th edition (Saunders Co.) 1-10.
- Stern IB, Everett FG and Robicsek K (1965).** Robicsek – a pioneer in the surgical treatment of periodontal disease. *Journal of Periodontology* **36** 265-268.