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REVIEW ARTICLE

Prosthodontic Treatment Preferences in Post Independent India: An over View

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Abstract Indian prosthodontics do not have a chronological document. This article is an attempt to record the event based prosthodontic history of India. This is a starting point.

Keywords History of prosthodontics · Indian prosthodontics · Trends in prosthodontic treatment · Evolution of prosthodontics · History of Indian prosthodontics

Formal instructional system of dental science came to India in 1920 when Dr. Rafiuddin Ahmed started the Dental College at Calcutta. This facility was upgraded to the status of university education in 1949 when the dental college was affiliated to the University of Calcutta. The dawn of scientific dentistry and Prosthodontics happened two years after the independence of our country. Sixty-four years of Prosthodontics in India is the net result of sustained practices and careful induction of advancements happened all over the world.

Complete dentures appeared in the Indian scene with vulcanite bases and porcelain teeth. The teeth had paired golden pins and diatorics (cylindrical holes in the base of teeth) to ensure mechanical retention to the denture base. Porcelain teeth were hard and heavy and made 'clacking' sounds. Vulcanite was reddish brown in colour and was supplied in sheets with an adhesive surface. Pieces of these sheets were accommodated in the mould and processing was done in an air tight compartment. Inter ridge space was a great constraint in accommodating porcelain teeth. In spite of all the shortcomings, vulcanite dentures were used by our earlier dentists. In 1950s acrylic started replacing vulcanite as well as porcelain teeth. For retention of maxillary dentures, suction chambers and rubber suction cups were employed. The practice of suction devices was in vogue till early 1970s.

Complete denture was the major treatment option till 1970 because restorative practices have not become popular especially in the rural India. Tooth ache was mainly treated with dental extraction. And if tooth ache was quite frequent either due to dental caries or periodontal disease, many people opted for complete dental extraction. Naturally complete dentures replaced the lost teeth. Complete dentures were designated either as full dentures or full teeth sets. Impressions were made in the initial stages with modified 'plaster of paris' or bees wax. By 1960s impression compound was popularly used as a preliminary impression material. This was either used as a tray or used for fabricating a primary cast. The use of custom made tray, border moulding with green stick compound and lining with zinc oxide eugenol impression paste to make final impression and a master cast, reined the scene till the end of the twentieth century. In many parts of India, an alginate impression replaced all other impression systems described. In an attempt of cost cutting, final impressions were discarded by many practitioners and which had a far reaching negative effect on the prognosis of complete denture treatment. Twenty-first century has witnessed the increasing use of elastomeric impression materials. Putty consistency material with an addition of petrolatum has become the material of choice for border moulding. Light body and regular body materials were slowly replacing zinc oxide eugenol as lining materials for final impressions. [1].

The use of articulators was well recognized but it was restricted to hinge articulators till 1970. Dentists used

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different adaptations of hinge articulators. However students of dentistry were instructed to use adaptations of Gysi fixed path articulators. Semi adjustable articulators remained within the four walls of postgraduate departments. This was considered as an ornamental instrument used during the examinations and prosthodontists seldom used it in regular clinical practice. Winds of change started blowing only during the twenty-first century when young prosthodontists have developed an interest in the use of semi adjustable articulators [2]. Prosthodontists took pride in possessing their own semi-adjustable articulators only in twenty-first century. Diagnostic evaluation of completely edentulous individuals has become more effective and formal. Radiographic evaluation using OPG and CBCT has brought in much definiteness to the diagnostic profile of the edentulous patient. The classification system proposed by the American College of Prosthodontists for edentulous individuals provided a link to prognosis and which is helpful for both clinicians and students. The classification not only helped in the selection of an effective treatment plan, but also served as an aid in reconciling expectations with outcomes. Integration of dental implants with complete dentures has opened up a new possibility in improving the prognostication. This has happened because implants have moved from the ideal treatment sector to a realistic one. ACP class IV patient has become a frequent appearance and many of them were long term denture wearers and required a new denture for the third or fourth time. The improved life expectancy has in fact complicated the prognosis of complete denture wearers because the onset of edentulism still happens in the fifth or sixth decade [3, 4].

Removable partial denture practice might have preceded complete dentures in India. Carved out teeth from human and animal sources, attached to the remaining teeth with wires, were the first generation partial dentures. Acrylic partials were popular in the latter half of the twentieth century. Village dentists preferred self cure dentures fabricated in the mouth. This practice has not disappeared from India and still in vogue in market areas. Even though acrylic partials were popular with practising dentists, the correct technique of fabrication never appeared in instruction manuals or text books. Text books always described cast partials and forced dentists to brand acrylic partials as gum strippers. In fact maxillary partial dentures seldom do gum stripping because of the support they receive from the palatal vault. Prosthodontists maintained an apologetic attitude towards acrylic partials, in spite of the useful service they rendered to the common man. Wrought wire clasps were not used intelligently and because of poor instructions incorporated in the undergraduate course, dentists have become incompetent in this select area. Good quality wrought wires are not made in India and cold working fractures many clasps either during fabrication or during the service [5].

Cast RPDs were not popular in India during the post independent period because of the lack of laboratory facilities. In the later period also it has not become popular. Even though laboratories increased in number, their focus was mainly on fixed prosthesis. The unaesthetic clasps also deterred many patients. Kennedy Class IV cast RPDs have practically disappeared from the scene. However mandibular Kennedy Class I partials still find an application. Clasps like back action, reverse back action, extended arm and hairpin clasps have become real museum pieces. In the recent past, use of attachments is pushed by a group of technicians but many patients do not relish it because of the extensive tooth preparations of the abutments and which have to receive crowns. Many of the attachments do fail within a period less than five years in Indian conditions. Circumferential clasps and RPI clasps are the popular choices in cast RPDs. Amongst the rests; only occlusal rests are effectively utilized. Cingulum rests are not effective because of limited scope for a seat. Incisal rests seldom find an application. Cast RPDs are poor in aesthetics and incur high treatment cost. The popularity of fixed prosthesis and dental implants had a restrictive effect on the conventional cast RPDs. Flexible partial dentures slowly started appearing in the scene and their prognostic value is yet to be proven because the material is still in the upgradation phase [6].

Fixed prosthodontics in post independent period utilized both casted crowns and bridges and goldsmith fabricated swaged crowns. The design of conventional bridge incorporated intracoronal retainers. Pontics with two inlay retainers were a common sight till 1970. Dowel crowns (by name Davis and Richmond) were popular during the aforesaid period. Custom made post and core preparations have taken over later and remained popular till 1995. Afterwards pre fabricated posts, fibre posts and composite cores received dentist's attention because of the ease in fabrication technique. Highly complicated endodontic treatment with questionable prognosis and subsequent restorations with crowns were slowly discarded and that space was occupied by dental implants [7].

The transition that has happened with the materials related to fixed prosthesis can be branded only as revolutionary. Early 1990s found the brisk transformation from metal to metal ceramic restorations. Twenty-first century found the introduction of metal free ceramic restorations and CAD/CAM technology in India. Dentists had confusion with the gingival termination design because the text books described all sorts of terminations ranging from feather edge to shoulder and all of them could not be used because of the changing trends with the materials. Dentists are still hesitant to use a good quality shoulder or deep

chamfer because of the reluctance to use appropriately shaped diamonds and the fear of exposing the pulp. Fine tapered diamonds are used without any discretion from slicing the proximal surfaces to gross tooth reduction resulting in improper gingival terminations. Integration of principles of tooth preparation with clinical practice is still not complete. The longevity of fixed prosthesis did not receive critical attention in India and our references still consider western data bases published [8].

Independent India had a *maxillofacial* training centre situated in Delhi. Major attention was given to the fabrication of obturators. Ocular and finger prostheses were tried by dentists as a creative past time. Extensive acrylic based facial prostheses were tried during the early 1980s down south in Trivandrum. There was a hidden resistance towards acrylic prosthesis. Acrylic with artist's colours provided fairly good colour matching to dark shaded skin. These facial prostheses used spectacle frames as retentive devices. In late 1990s, silicone materials have appeared in India. Good quality skin adhesives are still a scarce material in India. Many of the silicone kits do not have adhesives to bind it with acrylic and the attributed excuse is still import restrictions. Maxillofacial prostheses are not promoted as an essential service to the disfigured human beings but still considered as a clinical report material with anecdotal observations. Exclusive training centres for maxillofacial prosthesis are not regular and successful in its establishment in India.

Endosseous Dental Implants showed its face in India through blade vent implants in 1960s. Within twenty years root form implants have got established. Many dentists including Prosthodontists got trained in dental implantology. Now dental implant is considered as a successful treatment option.

Studies on dental occlusion and temporo-mandibular disorders have received attention in the early 1980s. The number of patients who suffer from TMD have considerably increased either due to stress factors or due to extensive full mouth rehabilitations without due consideration of occlusion. The diagnosis has recently improved with the introduction of T scans and allied myographic facilities.

Research in prosthodontics has always been related to postgraduate departments of dental colleges. Mainly the experiments centered round materials, instruments, diagnostic systems and techniques. As on today 657 MDS seats are available for prosthodontics and a similar number of original research should be completed every year. If ten percent of these projects are published in indexed journals, India will be contributing substantially towards the science of prosthodontics. Statistical data on Prosthodontic treatment needs of our society is not available at present. Hence we find it difficult to formulate a Prosthodontic health policy for India. Research data should also be compiled to find out the original content so that the future research can be well directed. Clinical standards of prosthodontic treatment, available in India are on par with those available in any other part of the world. It is evident from the fact that India is now considered as a destination point for international patients. Prosthodontic training in fact needs a total revamp which is in the process. Only then the Indian Prosthodontic Science will emerge.

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