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Review Article

History and contribution of Indians to orthodotics: A review

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ABSTRACT

This article presents the evolution of dentistry and in particular orthodontics, in India and contribution of Indians to the field of orthodontics. We have come a long way since dental education was first introduced to us Indians, the wave of change brought about by the most esteemed and respectable pioneers of our profession, have led us to form a strong dental community in this world of tough competition. The pioneer of Indian dental education by Dr. H.D. Merchant, who gave first series of lectures in orthodontics. This article also prevents the work of great achievers of orthodontia, who have helped us raise the level of 'Indian Orthodontics" and have enabled us to soar to greater heights.
So, this review article presenting briefly on contributions of Indians to the field of orthodontics from the era of introducing orthodontics as a branch of specilisation of dentistry in India to recent achievements in this field.

1. Introduction

Indian dentistry has a long history dating back to the Stone Age. While investigating a fossil from Mehgarh, in the Indus river valley, today in Pakistan, Andrea Cucina and colleagues at the University of Missouri-Columbia discovered Indian dentistry 9000 years ago (7000 BC). The notion that ancient Indians invented the technology to drill teeth and eliminate decay was confirmed by the discovery of tiny holes filed into male molars.[1]

We can locate dental evidence in the Mahabharata epic. Karna was dying, therefore Lord Krishna requested him to provide a contribution to test his "Danaveerata" while posing as a Brahmin (Figure 1). Karna had given his golden teeth in return – this provides the evidence of tooth filling with gold during those age (2500 BC).[2]

Orthodontics cannot exist if there is no dental education." According to Dr. HD Merchant, the beginning of

Fig. 1: Karna donating his gold-filled tooth during the epic of Mahabharata[2]

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orthodontics cannot be considered till the beginning of dental education in India is known. We should thus investigate the origins and development of dental education through the establishment of numerous dental colleges in India. The number of dentists in India during the 1930s, the majority of whom received their education in England or America, could be counted on one hand. There was also no dentists act or All India Dental Association.[2]

Dr. Rafiuddin Ahmed founded the first private dentistry college in Calcutta in 1920 using his own personal funds, and more colleges soon followed.[2]

Beginning in Karachi in 1927, Dr. M.K. Patelin established the second dental college. Nair Hospital Dental College, the third, opened in Bombay six years later.[3]

2. The Start of an Era Desvelopment and Establishment of Famous Dental Colleges

The first Indian dental surgeon was Dr. Rafiuddin Ahmed (1890–1955), also regarded as the Father of Modern Dentistry in India (Figure 2). He graduated from the University of Iowa School of Dentistry in the United States in 1915 with a doctorate in dental surgery.

He established the Indian Dental Journal in 1925 in addition to the Calcutta Dental College, the first dental school in Asia and India, which is currently known as the Dr. R. Ahmed Dental College & Hospital**.**[1]

Fig. 2: Dr. Rafiuddin Ahmed (1890-1965), Father of Indian dentistry.[2]

2.1. Dr. Hari Krishan D Merchant

The first Indian dental surgeon was Dr. Rafiuddin Ahmed (1890–1955), also regarded as the Father of Modern Dentistry in India (Figure 3). He graduated from the University of Iowa School of Dentistry in the United States in 1915 with a doctorate in dental surgery.

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Fig. 3: Dr. HD Merchant

He served as the inaugural president of the Indian Orthodontics Society (1965–1967) and the inaugural editor of the IOS Journal. In recognition of his excellent contribution to dental education in India, the Pierre Fauchard Academy named him "Dentist of the Year" in 1976. This honour was given for the first time in India.

3. Beginning of Orthodontics as a Speciality in India

When Dr. HD Merchant delivered the first series of lectures on orthodontics at the Nair Hospital Dental College in Bombay in 1935, the term orthodontics was first used in India. And under the direction of Dr. HD Merchant, the first department of orthodontics was formally founded in the Nair Hospital Dental College in 1939.

In Nair Dental College, orthodontics was first taught as a separate subject in 1939, with practicals, lectures, and clinical work.[3]

Dr. Berry persuaded the Indian government to provide a grant in 1958 so that five to six PG courses could be started. At the time, active plates, expansion screws, oral screens, and inclined planes were the focus of orthodontics, along with a few functional appliances like the "Activator." Orthodontics was still in its early stages of development. Edgewise appliance and Tweed Philosophy were two fixed appliances in use at the time.[4]

The Indian Orthodontic Society was founded as a study group in Bombay, now Mumbai, in the year 1961, with no officers, no dues, and no constitution. Dr. NH Parikh used to organise lectures and periodic scientific gatherings.[3]

On Friday, October 15, 1965, the IOS was formally founded as the Indian Orthodontic Society. Dr. Naishadh Parikh served as the organization's first secretary and

treasurer for eight years, and the late Dr. HD Merchant served as president for three years. The additional founding members included the late Drs. AB Modi, Keki Mistry, Mohandas Bhat, Prem Prakash, and HS Shaikh 2.

Dr. BP Rajan opened the IOS office in Vellore on April 12th, 1998, with Dr. Asha Verma serving as president. In 1998, the IOS opened India's first dental museum and library at its Vellore headquarters. The first dental museum to be built in India was this one. The library holds various books and journals donated by our eminent doctors.

The first dental specialty to establish a professional certifying body in India was orthodontics, which led to the formation of the Indian Board of Orthodontics. Dr. T. Samraj launched the inaugural speciality board examination, which was held on September 29, 1999, in Bangalore. On October 2, 1999, the first convocation and certification were held in Bangalore. The late Dr. Prem Prakash served as the board's first examiner before being elected as the board's first chairman and secretary-treasurer, respectively.[5]

4. Some Famous Orthodontists of India

4.1. Dr. Prem Prakash, IOS President (1967 TO 1969)

Fig. 4: Dr. Prem Prakash

In 1947, Dr. Prem Prakash graduated with a BDS from De Montmorency Dental College at Punjab University in Lahore (Figure 4). He had gone to Dr. Begg's initial training on the Begg Technique in 1953. He started working at the CEM Dental College in 1954, and in the 1960s he served as a guide for Begg's method throughout India. He had switched from edgewise to Begg practise earlier.[6,7] Dr. Prakash served as the IOS's second president.[8]

Fig. 5: Dr. Ashok Balwant Rai Modi

4.2. Dr. Ashok Balwant Rai Modi, IOS President (1969 TO 1971)

Dr. AB Modi was another influential figure in the orthodontic field (Figure 5). Dr. AB Modi earned his BDS in 1955 from the Nair Hospital Dental College in Mumbai and his DMD in orthodontics under Dr. Korkhaus at Bonn University in Germany in 1959. He returned to Bombay by ship after completing his studies and began working as a part-time lecturer at Nair Dental College. He rose to prominence by helping to create orthodontics in India. For 28 years, from 1960 to 1988, he worked alongside Dr. HD Merchant to create the Nair Dental College and Hospital's orthodontics department. He was the third President of IOS 11 and a founding member. He was regarded as an expert in working equipment.[2]

4.3. Dr. HS Shaikh, Ios President (1971 TO 1973)

Fig. 6: Dr. HS Shaikh

Following his graduation from Sir CEM Dental College in 1954, Dr. HS Shaikh earned his MDS in orthodontics in 1961. (Figure 6). Dr. Shaikh received his training from Drs. Prem Prakash, AC Henriques, and V Iyer. He was hired as a professor at GDC Bombay, retired voluntarily, and then travelled to Libya where he spent 3.5 years teaching and leading the ortho department. Later, he accepted a position as a professor of orthodontics at King Saud University. He was a notable educator and one of the IOS pioneers. Additionally, he is in charge of spreading Begg's method in India.[9]

4.4. Dr. Naishad Parikh, IOS president (1973 TO 1975)

Fig. 7: Dr. Naishad Parikh, IOS President

Nair Dental College awarded Dr. Naishad Parikh a BDS in 1955. (Figure 7). The Indian Dental Association (IDA) selected him in 1957 to be the first student to complete an internship at Boston University in the United States. When he first arrived in India in 1961, he taught students at the Nair Dental College on a volunteer basis. That same year, he also opened his own clinic in Bombay. Dr. Parikh joined the Department of Orthodontics at Nair Dental College in 1962 after being awarded an honorary position there. He served as IOS's founding secretary and treasurer as well. In 1961, he brought the Jaraback technique to India.[10]

4.5. Dr. Keki Mistry, IOS president (1975 TO 1978)

One of the first dentists to offer orthodontics as a dental speciality in India was Dr. Keki Mistry, who is still actively engaged in his crucial line of work (Figure 8). He created the idea for Oral Health Day, observed by WHO on April 7 each year.[11]

4.6. Dr. Ravindra Nanda

At the University of Connecticut School of Dental Medicine, Dr. Ravindra Nanda is a professor, Head of the Department of Craniofacial Sciences, and Chairperson of the Division of Orthodontics. He was born on February 19, 1943. He is a pioneer in the development of numerous orthodontic appliances.[2] His clinical and research interests include craniofacial orthopaedics, adolescent and adult orthodontics, the biology of tooth mobility, biomechanics, and creating effective mechanics to provide orthodontic therapy.[12]

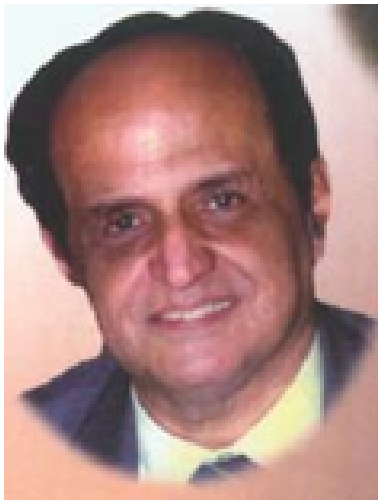

Fig. 8: Dr. Keki Mistry

Fig. 9: Dr.Ravindra Nanda

Some of his contributions are

1. Active retention: Is it necessary in the context of long-term retention and stability of dentofacial growth?.[13]
2. Cephalometric evaluation of the mandibular-maxillary sagittal relationship.[14] Clinical use of a technique to account for geometric effects while adjusting angle ANB.[15]
3. The Wits appraisal's long-term impacts of growth.[16]
4. Evaluation of symphysis morphology as a predictor of mandibular growth direction.[17]
5. A measurement of the nasolabial angle and the inclinations of the nose and upper lip in relation to one another.[13]

5. WASUNDARA BHAD

Wasundara Bhad professor of Government dental college and hospital Nagpur.The W angle was developed by Wasundara Bhad. [18]

5.1. Santhosh Kumar

Santhosh Kumar has just just developed a novel way for evaluating the AP jaw relationship called the Pi analysis. It uses the skeletal markers G and M points to represent the mandible and maxilla, respectively, and consists of two variables, the Pi-angle and the Pi-linear. [18]

6. Contribution by Op Kharbanda

Table 1:

CT scans release much more ionising radiation than traditional radiographs, according to a comparison of the radiation levels from the two types of dental radiographs. When comparing a CT scan to a survey using traditional radiographs, this aspect should be taken into account. Despite the fact that CT scans are superior to conventional radiography in many ways, the high radiation dose to patients and the cost of the treatment should be taken into account. [19]	2003
	2017
	2003
A thorough analysis and its conclusion that orthodontic forces affect cytokine and receptor levels in gingival crevicular fluid Applying orthodontic stresses results in an instantaneous release of inflammatory bone-resorptive mediators (IL-1, TNF-), which peak in 24 hours. This supports the idea that inflammation plays a role in the development of early OTM. Following the application of orthodontic force, levels of bone-forming mediators such OPG fell, showing that bone resorption was the primary mechanism causing tooth displacement. After reaching their peak levels, cytokines begin to decline, typically after 24 hours in continuous forces, although repeated activations in interrupted forces increase the secretion of cytokines. Pain intensity has been associated with a rise in GCF levels of IL-1 at greater force levels (150 vs. 50 g). [20]	2014
A systematic review and meta-analysis of cephalometric research on the morphology of the craniofacial region and the upper airway in adult patients with obstructive sleep apnea.[24]	1998
Oral habits in school going children of Delhi: a prevalence study. [21]	2004

6.1. Dr. Rohan Mascarenhas

Orthodontic management of malocclusion with the absence of the maxillary canines is a difficulty for an orthodontist, according to Dr. Rohan Mascarenhas, who proposed Management of tooth size difference due to previously extracted maxillary canines. Before deciding on a course of treatment, Bolton's disparity should be thoroughly examined.

When changing premolars into canines, aesthetics should be taken into account in order to create healthy gingival height and mesiodistal dimension. In this unusual circumstance, the incorporation of buccal root torque in canine replacement premolars will aid in reaching positive outcomes.

His other contributions are

1. Rotation Wedges for Forsus Treatment. [22]
2. A New Approach to Indirect Bonding. [23]

7. Contribution by Anmol.S

Soft-tissue cephalometric standards in a population of South Indian ancestry, and his finding was in certain important criteria, there were statistically significant disparities between South Indian men and women. Men's soft tissue structures are thicker than women's, and their nasolabial angles are more acute. Men have longer faces, whereas women have wider interlabial spaces and more exposed maxillary incisors. Compared to women, men have deeper-set facial structures. South Indian respondents have higher protrusive dentitions and deeper-set midfacial features compared to established norms for white persons.

Use of the Moyers mixed dentition probability tables and novel forecasting tools in a modern Indian population-Nebu Philip Ivan Saroj Chopra, Deepak Arora, and Manisha Prabhakar. [24]

7.1. Pradnya Patil

The analysis of the elements in the retrieved orthodontic miniscrews and their surface deterioration led to the conclusion that Analysis using a scanning electron microscope revealed that the MSIs' as-received surface manufacturing flaws appeared as stripes. They met the requirements set forth by the American Society for Testing of Materials for Surgical Implants in terms of elemental makeup. The surface dullness, varying corrosion, craters in the head, neck, body, and tip regions, and blunting on tips and threads were all seen in the recovered MSIs.

Energy dispersive x-ray analyses revealed the deposition of additional elements: cerium was observed in greater proportions in the head region by 0.128 weight percent, iron was observed in greater proportion in the failed retrieved MSIs compared to the successful miniscrews, and calcium had greater significance in its proportion in the body region by 0.056 weight percent. [25]

A Cephalometric Assessment and Comparison of the Changes in Skeletal, Dentoalveolar, and Soft Tissue Caused by the Forsus Fatigue Resistant Device and the PowerScope Fixed Functional Appliance. [26]

7.2. Arun Kumar

Establishment of Cephalometric Norms for the South Indian (Karnataka) Population Based on Burstone's Analysis was first published by K.V.Arun Kumar. His judgement was In comparison to people of Caucasian heritage, men and women of South Indian origin have significantly different skeletons. Men exhibited proclined upper incisors, decreased facial divergence, and anterior maxillary dental height. Women possessed a somewhat larger cranial base, a taller midface, and proclined upper incisors.

8. Conflict of Interest

None.

9. Source of Funding

None.

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