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RESEARCH ARTICLE

HISTORIC EVOLUTION OF DENTAL IMPLANTOLOGY

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ABSTRACT

Aim: The aim of this paper is to get the history of Dental Implants in chronological order. This collection of historical perspective in Dental Implantology leads to a thorough understanding of all the tireless work done by the pioneers in this field to come to this stage. **Background:** Dental Implantology have evolved drastically over the years but its origins take roots as early as 2500 BC. Dental Implantology has been a constantly evolving field with new inventions coming up every now & then. Inorder to understand the inventions it is better to get to know the history behind it properly. **Conclusion:** Dental Implantology is a constantly evolving field, knowing the history of it helps to achieve new innovations in a better way.

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INTRODUCTION

From time immemorial, having a complete set of teeth is given importance both for functional and aesthetic reasons. This desire to have teeth made people invent various products to find a suitable alternative for natural teeth. With technological advancement, dental treatments involving dental implants have gained increased acceptance by patients. Improved reliability of dental implants along with greater acceptance of minimal invasive restorative treatment, have made implant treatment the first choice of treatment offered to patients. Dental implants are the most sophisticated tooth replacement options and with current technologies has the highest success rate over the less permanent options. A surgery is performed to place the implant that is later capped with a crown. With proper after care and good oral hygiene practices, Dental implantology is the future of teeth replacement in dentistry.

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Dental implants is one of the best forms of treatment for replacing a tooth. The benefits are both functional and esthetic. Advantages of Dental Implantology are:

- Brings back function
- Esthetically satisfies patient
- Maintains alveolar bone height
- Gives support to adjacent teeth and prevents displacement

Implantology may seem like new age invention but its history is very long and interesting. For as long as there have been people, they have also been unhappy about losing their teeth. So the historic knowledge of Dental Implantology should be sound to understand the evolution of Dental implants.

History and evolution in chronological order:

The history of the evolution of dental implants is a rich and fascinating journey through time. Since the beginning of mankind, humans have used dental implants in one form or the other to replace missing teeth.

- 2500 BC, The ancient Egyptians tried to stabilize teeth that were periodontally involved with gold ligature wires.
- 500 BC, The Etruscans customized soldered gold bands from animals to restore oral function in humans; they also fashioned replacements for teeth from oxenbones.[1]
- At about the same period, the Phoenicians used gold wire to stabilize teeth that were periodontally involved.
- 300 AD, used teeth creatively carved out of ivory which were then stabilized by gold wire to create a fixed bridge.[2]
- 600 AD, Mayans used first dental implant where they used pieces of shells to insert the mandible and replace as teeth.
- 800 AD, A stone implant was first prepared and placed in the mandible by the Hondurans[1].
- 1700's, Dr. Hunter suggested transplanting teeth between humans; he experimented by implanting an partially developed tooth into the comb of a rooster. Changes he observed were that the tooth got firmly fixed in the comb of rouster and he noticed blood vessles growing into the pulp.
- 1809, J. Maggiolo implanted a gold tube into the fresh extraction site. This site was allowed to heal and then a crown was added later[2].
- 1913, Dr. EJ Greenfield, used pure 24 karat gold made onto a cylinder made up of irido platinum as root form implant to fit into a circular incision made in maxillae of patients[3].
- 1930's, Drs. Alvin Strock and Dr. Moses Strock, in continous experiments with Vitallium implanted them in both humans and dogs to give individual teeth.
- 1938, Dr.P.B. Adams used an endosseous implant in cylindrical root form with threads both internally and externally, giving a gingival collar and a healing cap.
- 1940s, Formiggini and Zepponi developed a post-type endosseous implant. The spiral stainless steel design of the implant helped bone formation inside the metal[2].
- Dr.Perron Andres from Spain modified Formiggini's spiral design by incorporating a solid shaft inside.
- 1940's, Dahl in Sweden developed the subperiosteal implant[2].
- 1950s, Lew used a direct impression method which used fewer supports over the ridge crest.
- 1960's, Dr.Cherchieve designed a double-helical spiral implant; material used were cobalt and chromium[5].
- 1960's, Dr. Giordano Muratoriby contributed the addition of internal threading to the shaft of the implant[4].
- 1950s, Dr. Per- Ingvar Branemark, an orthopedic surgeon, he was experimenting with a time machine made of titanium in the femur of rabbit. He eventually forgot that the machine was placed inside. After a while when he tried to isolate the machine, he noticed osseointegration. He continued to do a series of experiments on titanium and bone which eventually led to the modern day Dental Implants.
- 1963, Dr.Leonard Linkow modified blade implant into spiral design[4]
- 1965, Dr.Branemark used a human volunteer to place the first titanium dental implant. This led to the massive usage of dental implants as a treatment option in Dentistry[6].
- 1977, Dr.Tatum proposed "sinus lift" procedure. This is an ideal treatment option in maxillary posterior bone which gets atrophied due to edentualism.
- 1978, Dr.Branemark presented a two-stage root-form threaded titanium implant; he developed and tested a system using pure titanium screws which he termed as fixture[7].
- 1979, Dr.Branemark introduced short implants with a length of 7mm[8].
- 1980's, Dr. Tatum introduced the omni R implant; it had horizontal fins made up of titanium alloy[9].
- 1980's, Dr.Niznick developed the Core-Vent implant. He added a hydroxyapatite coating on it and called it Screw-Vent implant. He continued to develop other systems likeMicro-Vent and Bio-Vent.
- 1980's, Dr.Driskell developed the Stryker root form endosseous implant; there are two types of this-one made with a titanium alloy and another coated with hydroxylapatite.[10]
- 1980's, The Calcitek Corporation started making a synthetic polycrystalline ceramic hydroxyl apatite called calcitite.
- 1980s, Gerard Scortecci invented the Basal Implant system[11].
- 1985, Straumann Company plays a key role in developing the Integral Implant System. It has plasma sprayed cylinders and screws which can be placed in single stage operation.
- 1990s, Paulo Malo introduced the "All-on-4" system of Implants after a series of funded studies by Nobel Biocare Implants[12].
- 1990s, Dr.Branemark introduced Zygoma Implants. Usage of angled, longer implants in maxillary posterior region to get anchorage from the zygoma[13].
- 2005, CeraRoot introduced ceramic implants. FDA approved its use in 2011[14].
- 2007, Branemark proposed a new concept of placing the fixtures in single step.

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