

# IN THE NAME OF GOD

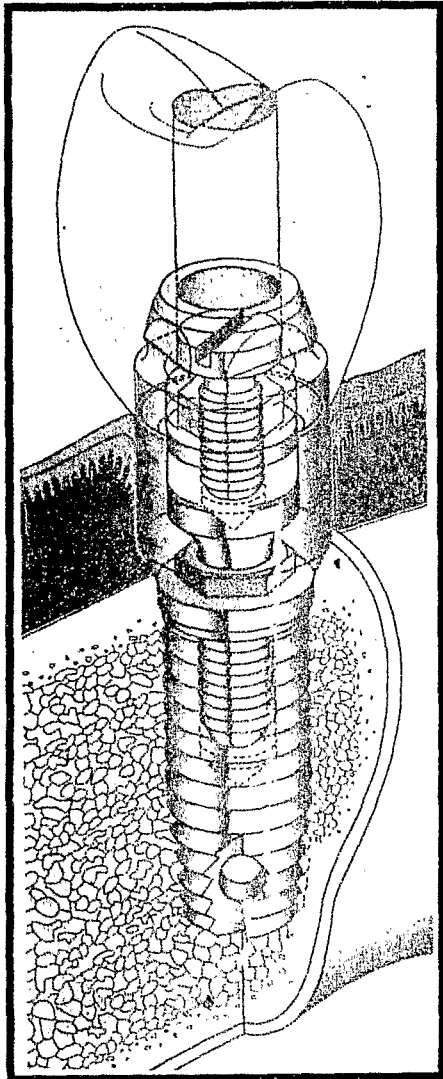
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**Shiraz University of Medical Sciences**  
**School of Dentistry**



**THE BRANEMARK  
TOOTH IMPLANT SYSTEM**

**Thesis For Fulfillment D.M.D degree**

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پیرس

**Dedicated to:**

**My honoured father & mother whose encouragement & sacrifices made possible my progression.**

**Dedicated to:**

**Whose encouragement & sacrifices made possible my progression**

**& To My teachers**

تقدیم به پدر و مادر عزیزم که تشویق و زحمات آنان پیشرفت  
مرا میسر و آخت

و تقدیم به: تمامی مربیان، آموزگاران، دبیران و اساتید محترم

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M.Sc.D prosthodontic from Boston University.

PH.D.from Harvard University, former assistant professor School of dental medicine in Harvard University.

Assistant professor & chairman department of crown & Bridge, School of Dental Medicine in Shiraz University.

Member of American implantology.

Has contributed immensely to the sustained effect it took to complete this project.

His evaluation & guidance in the production of illustration were especially valuable

M.Goodarzy Shirazi

School of Dentistry

## **FOREWORD**

**In the early 1950s, the young researcher Per - Ingvar Branemark discovered that titanium could integrate with bone tissue.**

**In 1965, after more than ten years of of research and development work, the first patient was given new teeth based on titanium implants.**

**This thesis, " theBranemark tooth implant system", provides important information about this method of oral reconstruction, briefly.**

**Shiraz - Iran - 1995**

**M - Goodarzi. Shirazi**

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# The Branemark Tooth Implant System



*Professor Per-Ingvar Branemark*



## The Branemark Tooth Implant System

### Preface

*Toothlessness, or edentulousness, as it is known medically, has been a major problem for many people since time immemorial. The difficulty of chewing with the fear of showing other people that they have no teeth has forced many people into social isolation.*

*Many elderly people have been obliged to use removable prostheses. This solution has functioned satisfactorily for some of them, where as it has resulted in tremendous problems for others, not least mentally when the prosthesis has "slid" about in the mouth without the patient being able to control it.*

*In some cases, it has been possible to offer patients who still have some of their own teeth a permanent bridge. The disadvantage of this type of solution is that the patient's own teeth are perhaps lost at a later stage, there is a risk that the entire bridge structure will cease to function.*

*For many patients the alternative nowadays is what is known as an implant - anchored bridge. The bridge is anchored to the jawbone using dental implants.*

*The discovery that titanium integrates with human tissue, thus enabling the titanium implant to act as a support for new teeth, was made back at the beginning of the 1950s by the famous Swedish researcher, Per - Ingvar Branemark.*

*In 1965, professor Branemark treated his first edentulous patient and that implant - anchored bridge is still functioning perfectly today.*

## The Branemark Tooth Implant System

*Since then, more than 300,000 patients all over the world have been treated and it is this that makes the Branemark system implant method unique. The method has been documented for three decades by means of meticulous, systemic development work.*

*The patients who receive this treatment at the present time can rest safe in the knowledge that there is very chance that it will succeed.*

*Should an individual implant fail to integrate with the jawbone for any reason, a bridge will still function perfectly on the remaining implants in many cases.*

# The history & evolution of tooth implantation

## The history & evolution of tooth implantation.

Throughout history, many clinicians have attempted to use dental implants as a solution to edentulism & partial edentulism. Unfortunately, many of this work has resulted in failure. However, without the work of the early investigators to build upon, we would not enjoy the success that we now have. It is critically important to understand how oral implantology has evolved to understand where we have been, & where we are going.

Since antiquity, man has attempted to solve the problems associated with the failing dentition. Starting as early in 2500 B.C., evidence exists of the attempts at stabilization of periodontally compromised teeth with the use of gold ligature wire. (fig 1-1)



Fig. 1-1

Dating to approximately 500 B.C, the Etruscan population utilized soldered gold bands incorporating pancies from animals to restore masticatory function as a bridge. (Fig. 1-2).

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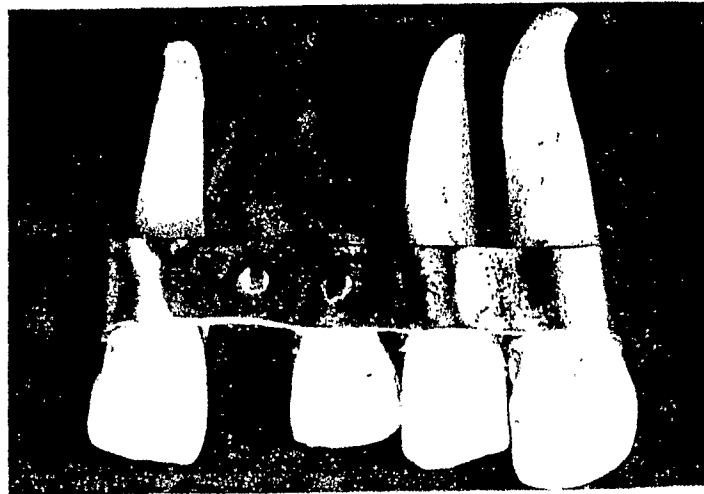


Fig. 1-2

*The phoenician population in approximately 500 B.C., Utilized gold wire to stabilize periodontally compromised teeth. (Fig, 1-3)*

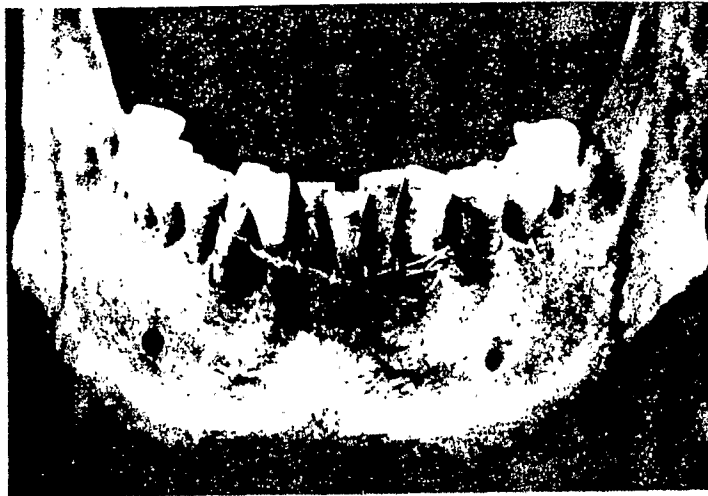


Fig. 1-3

*The phoenician population, in 300 A.D., later developed a fixed bridge replacement utilizing carved ivory teeth stabilized by gold wire (from Ring) (Fig, 1-4).*

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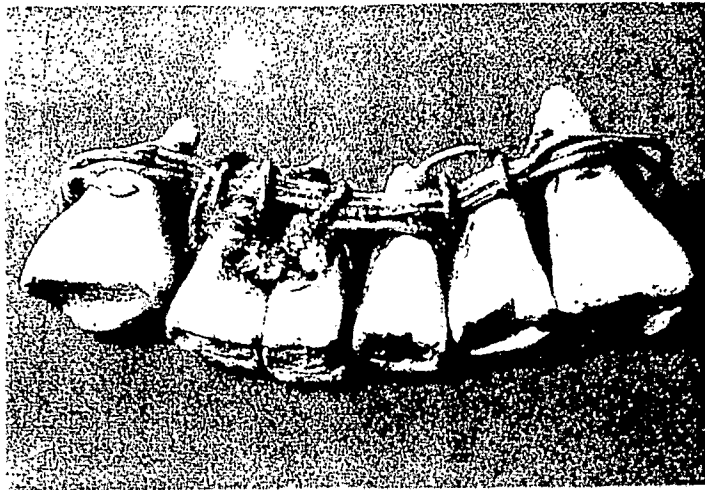


Fig. 1-4

*The first evidence of the use of implants goes back to 600 A.D. in the Mayn population. This fragment of the mandible; illustrates the implantation of piece of shell to replicate three lower incisor teeth (from ring) (Fig, 1-5).*



Fig. 1-5

*In the mild 1600's, evidence of stabilization of periodontally compromised, teeth was demonstrated in Europe (from Ring).*

*In the 1700,s, John Hunter suggested the possibility of transplanting the teeth of one human into another. To support this hypothesis, he conducted an*

## The Branemark Tooth Implant System

experiment in which he placed an incompletely developed tooth into the comb of a rooster. He observed that the tooth became firmly rooted in the comb, & that the rooster's blood vessels grew directly into the pulp of the tooth. (from Ring).

The process of transplantation became popular, although eventually fell into disrepute in the 1800's. Rejection & the transmission of various diseases, including syphilis, were major problems. This caricature by Rowlandson satirized the practice of removing teeth from impoverished people & transplanting them into the mouths of the affluent.

In 1911, Greenfield described the fabrication & insertion of an endosseous implant. The recipient site was prepared utilizing a trephine. (Fig, 1-6).

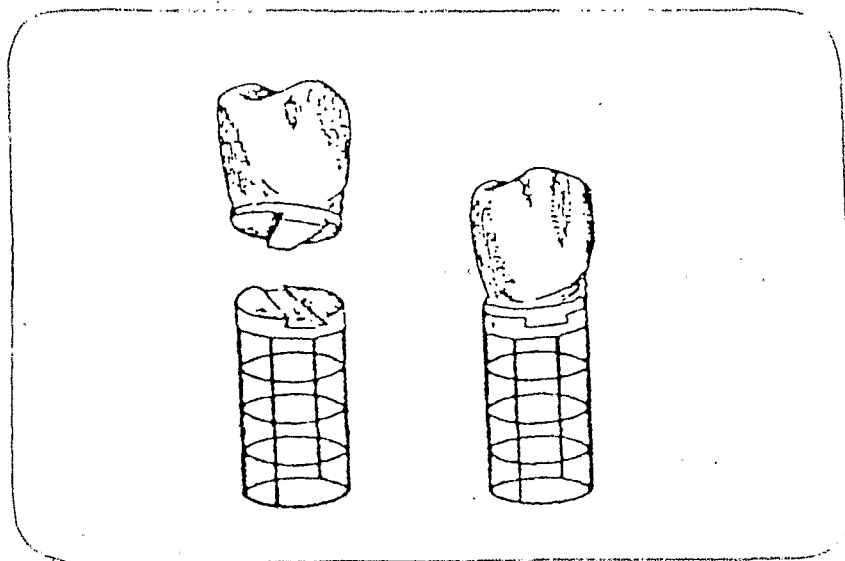


Fig. 1-6

In 1939, Strock described a method of placing a vitallium screw to provide anchorage for replacement of a missing tooth (computer-enhanced image from Strock, 1939) (Fig, 1-7).

## The Branemark Tooth Implant System

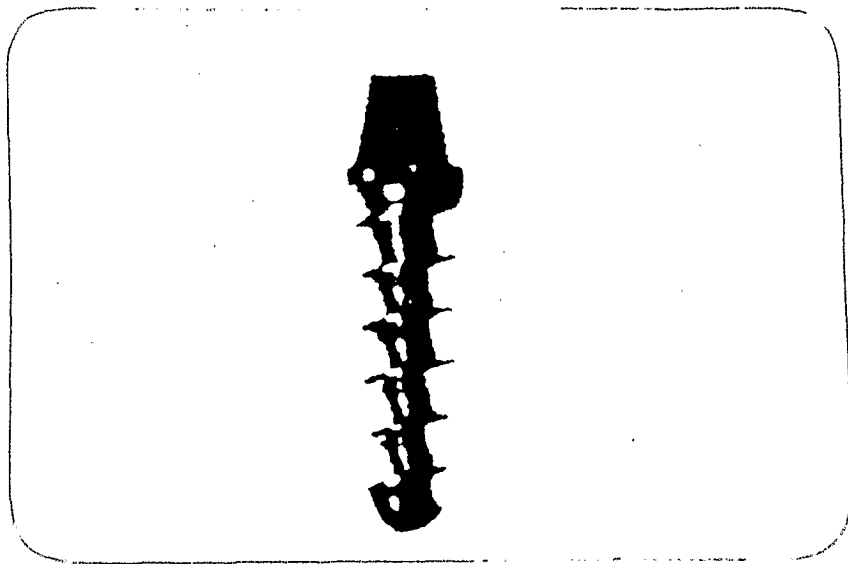


Fig. 1-7

*Dahl first suggested the construction of the subperiosteal type of implant in 1943. This type of implant were improved by Goldberg, Lew & Bodine (Computer reconstruction from Dahl, 1943) (Fig, 1-8, 1-9)*

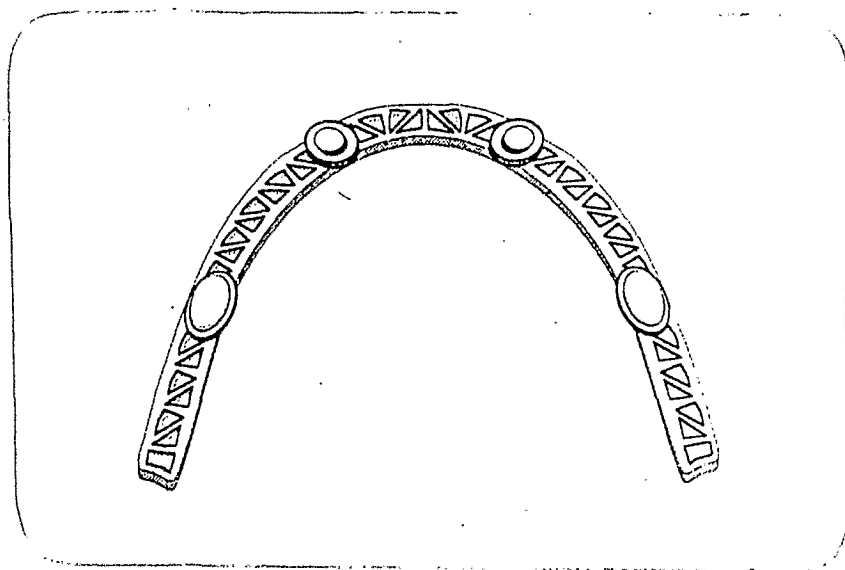


Fig. 1-8

## The Branemark Tooth Implant System

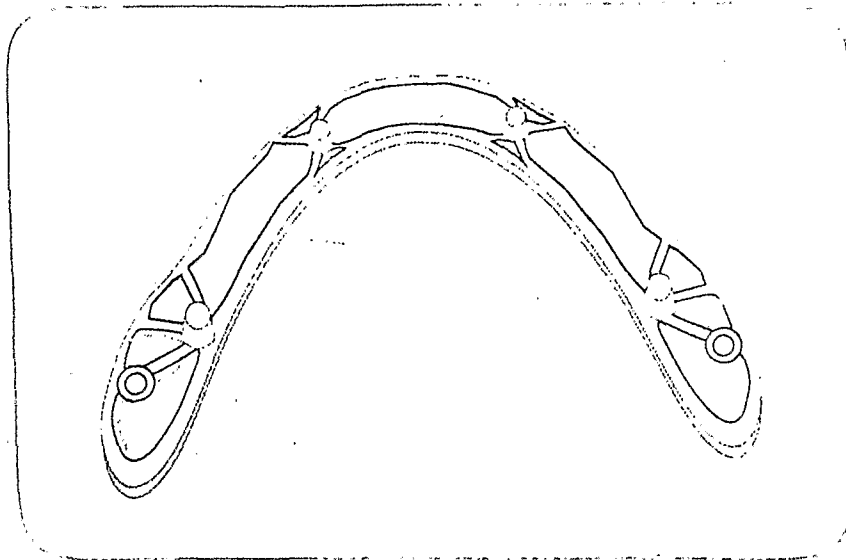


Fig. 1-9

*In the early 1960s, Scialom described the use of tripodial enosseous pin arrangement. It acted as anchorage for simple crown or for permanent fixed bridge. (Computer-enhanced image from Scialom, 1963) (Fig. 1-10).*

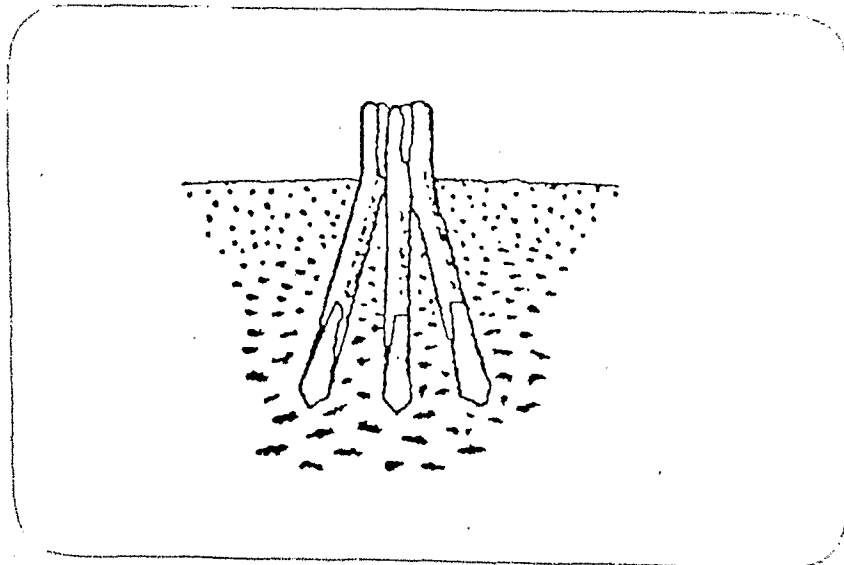


Fig. 1-10

*Orlay, in the early 1960's, reported numerous cases in which he utilized virilium posts that were placed into the canals of endodontically treated teeth with extension beyond the apex. Reportedly, this enhanced the crown/root ratio*



## The Branemark Tooth Implant System

of the compromised teeth (Computer-enhanced image from Orlay, 1965) (Fig. 1-11).

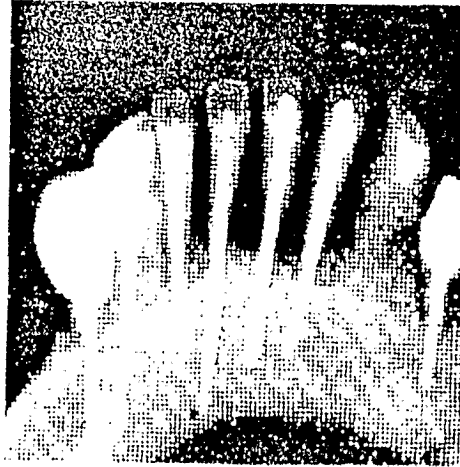


Fig. 1-11

Also, in the early 1960's, Linkow developed the ventplant implant. This was a self-tapping type of endosseous screw implant (computer-enhanced image from Linkow, 1967) (Fig. 1-12).

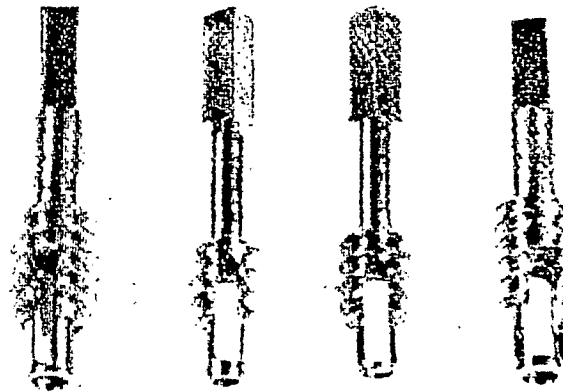


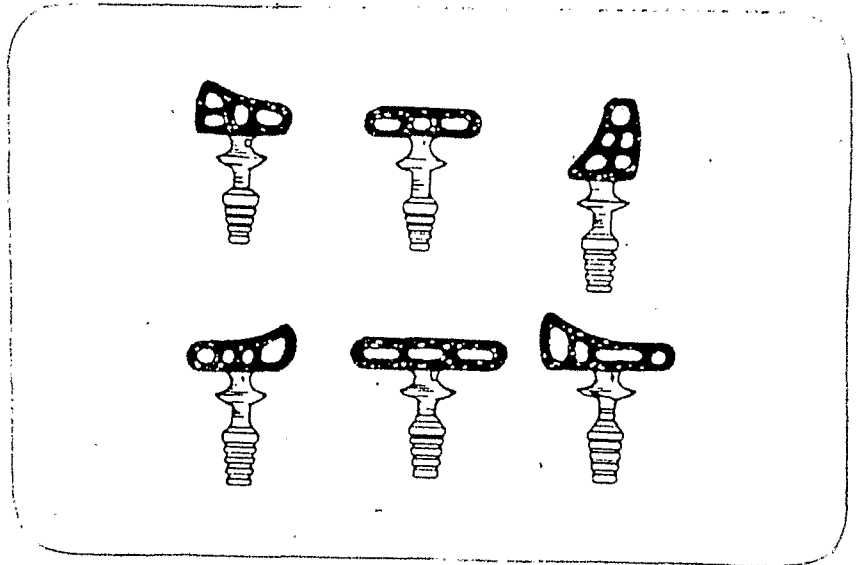
Fig. 1-12

By the mid 1960's, Linkow introduced the blade vent implant which originally designed for use in the "knife edge" ridge. He later adapted the dressing of this

## The Branemark Tooth Implant System

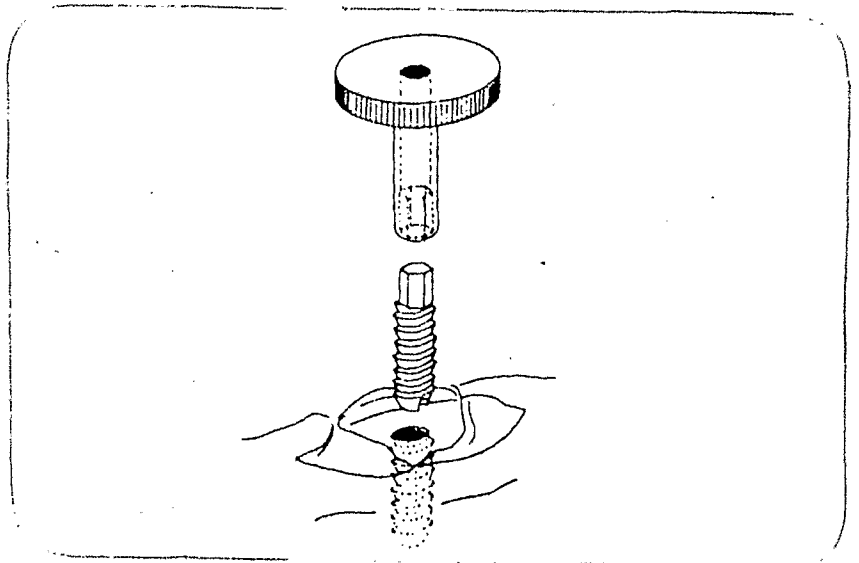
implant for use in most clinical situations (Computer-enhanced image from Linkow, 1968) (Fig. 1-13).

Fig. 1-13



The crystalline bone screw consisting mainly of aluminum oxide developed by Sandhaus in the mid 1960's (Computer-enhanced image from Sandhaus, 1968) (Fig. 1-14).

Fig. 1-14

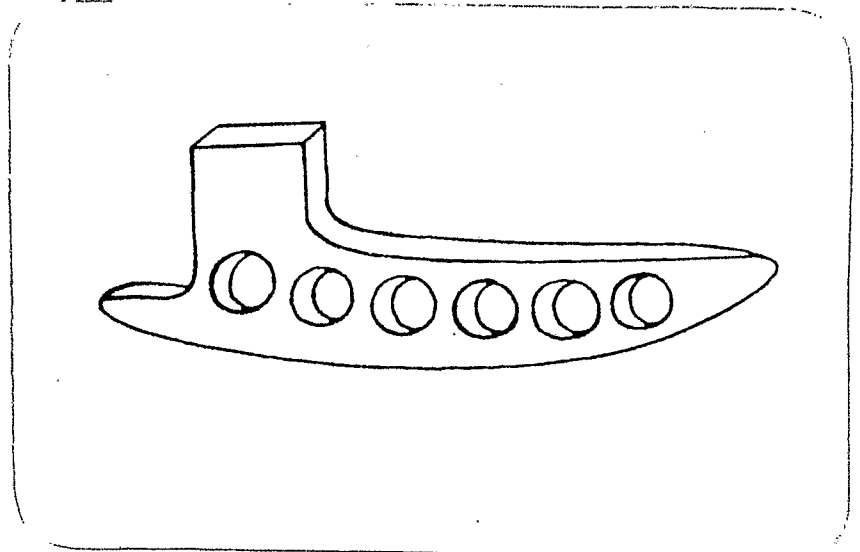


In that decade in "Ramus Blade Endosseous Implant" was developed by Roberts & Roberts. It was to serve as "Synthetic lower third molar"

## The Branemark Tooth Implant System

(Computer-enhanced image from Roberts & Roberts, 1970) (Fig 1-15).

Fig. 1-15



By the early 1970's animal studies began on the use of non-metallic types of endosseous implant. In 1975 the first "synthodont aluminum oxideim plant" was placed in human.

The mandibular staple implant (Fig 1-16) & the Ramus Frame implant (Fig 1-17) were developed in 1970's. (Computer-enhanced image from Small, 1978 & Cram, et al., 1972).

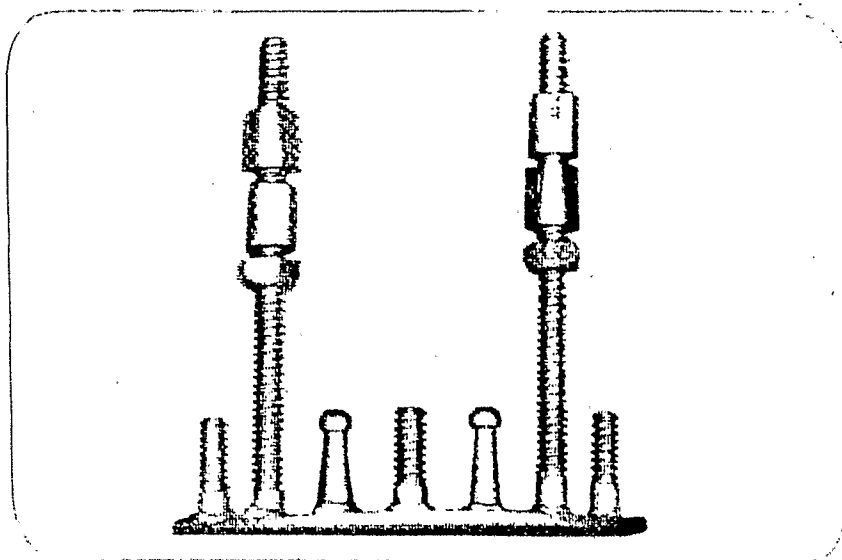
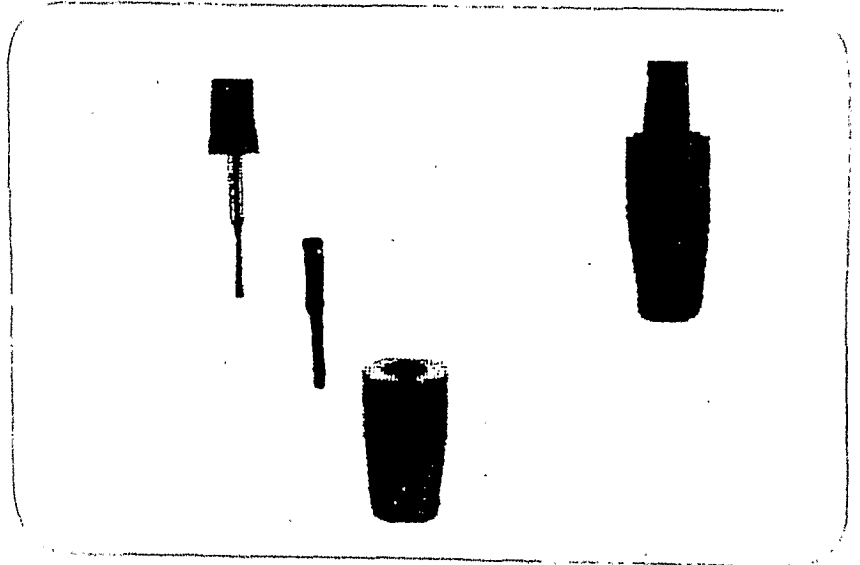


Fig. 1-16

## The Branemark Tooth Implant System

*Vitreous carbon implants were first placed in canines in the early 1970's by Grenoble. Based upon biocompatibility & efficacy studies, human clinical trials began on the use of this implant (Computer-enhanced image from Grenoble et al., 1973) (Fig 1-18).*

Fig. 1-18



*In the early 1980's, Tatum introduced the "Omni R implant". This is a titanium alloy root form implant with horizontal pins, designed to be placed into a prepared or expanded endosseous receptor site. (Tatum, 1986) (Fig 1-19).*

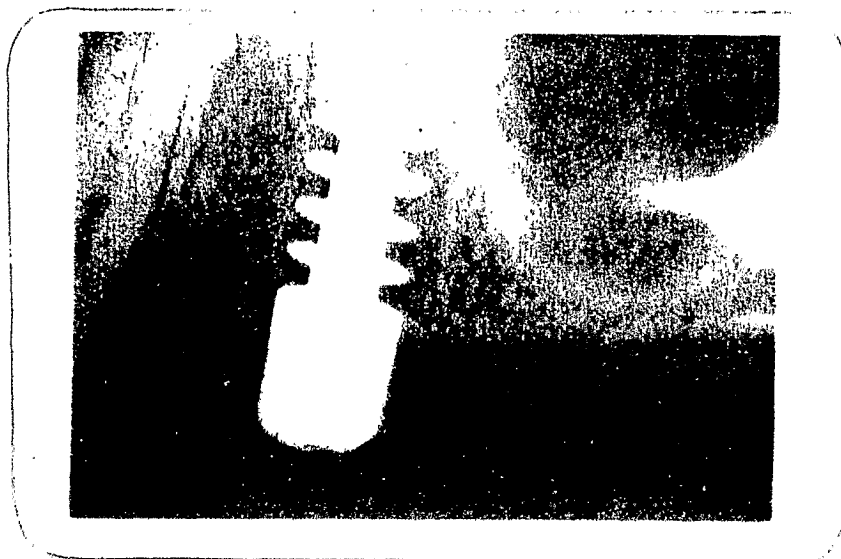


Fig. 1-19