

Title: Strategies to achieve fit in prosthodontics , effect of spark erosion

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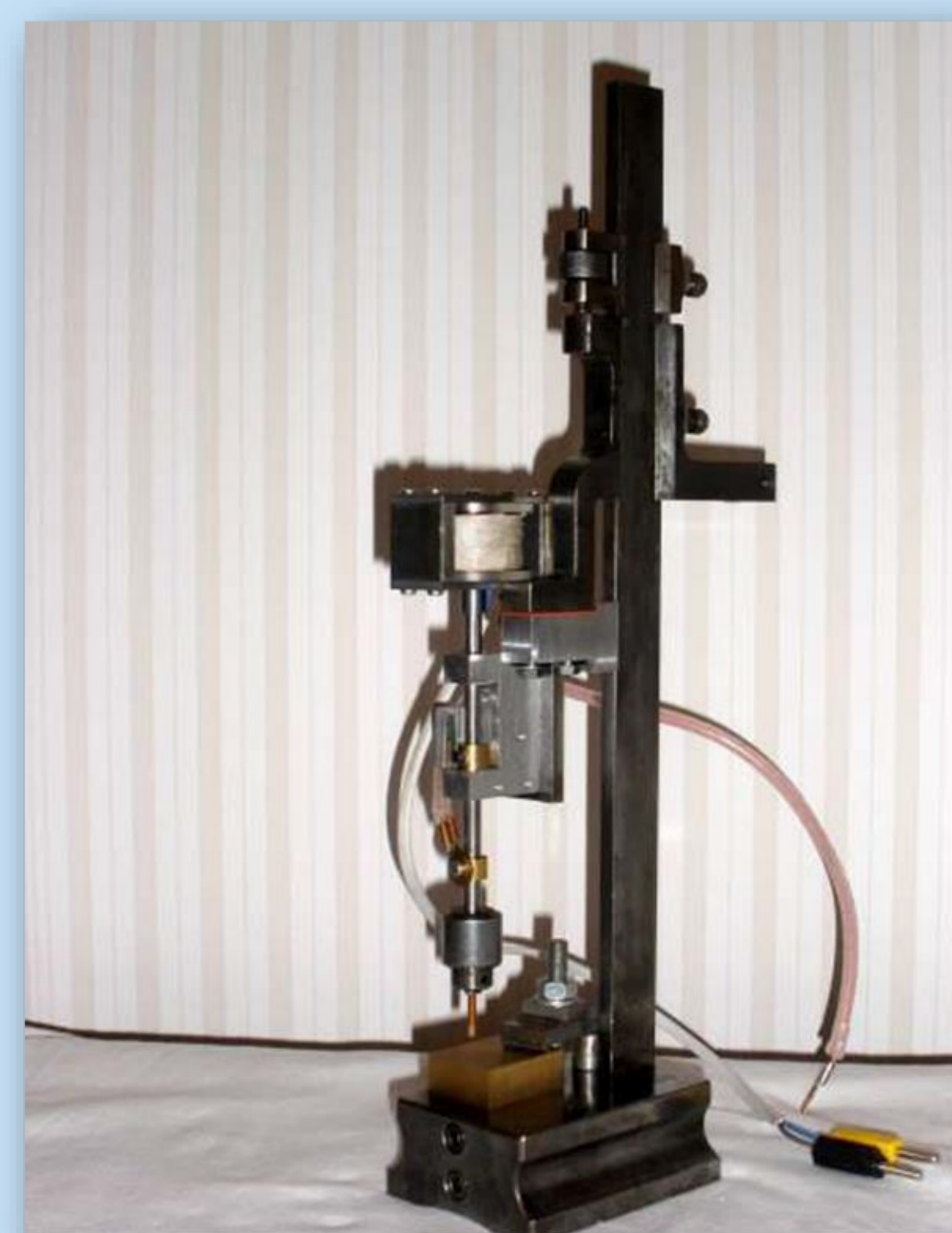
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Background

Introduction: Spark erosion technology is a highly advanced system for producing the ultimate in precision fit of the prostheses frameworks. In this process metal is altered in a form using short-circuit impulses created within a dielectric medium similar to light oil. This process became more popular in the early 1940s in the tool and die industry. Since then, the dental profession has adapted its uses for fabricating precision-removable partial dentures, titanium crowns, and implant-retained overdentures.

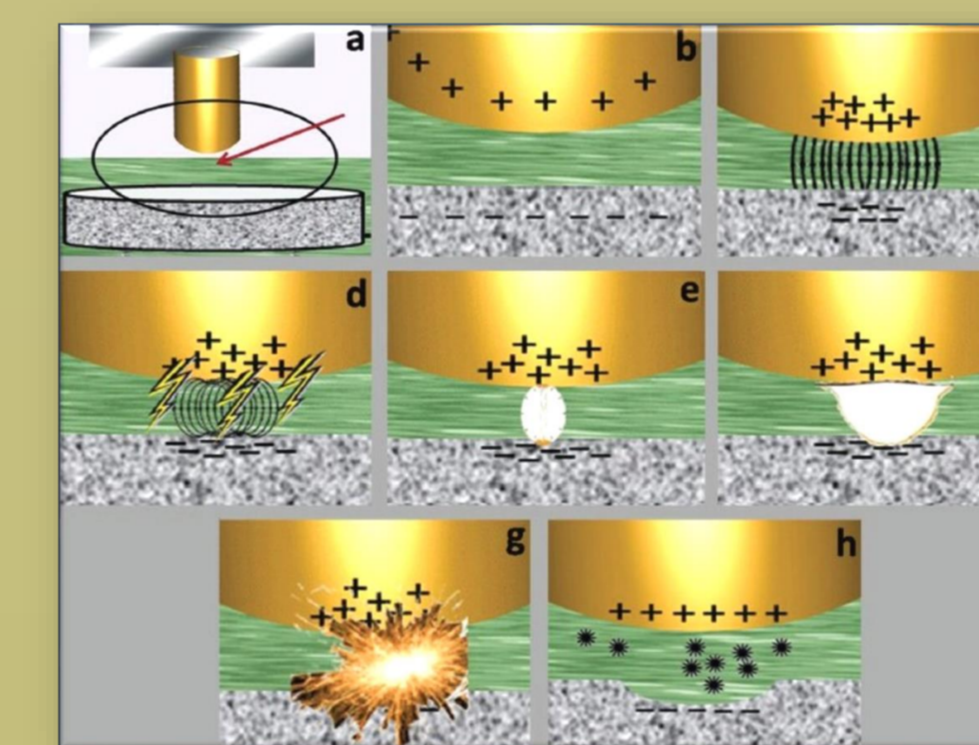
Aims

Modern precision laboratory procedures have a profound edge over traditional laboratory procedures in fabricating more ideal and precise restorations. This article discusses one such procedures i.e. spark erosion process, otherwise known as electric discharge machining(EDM).



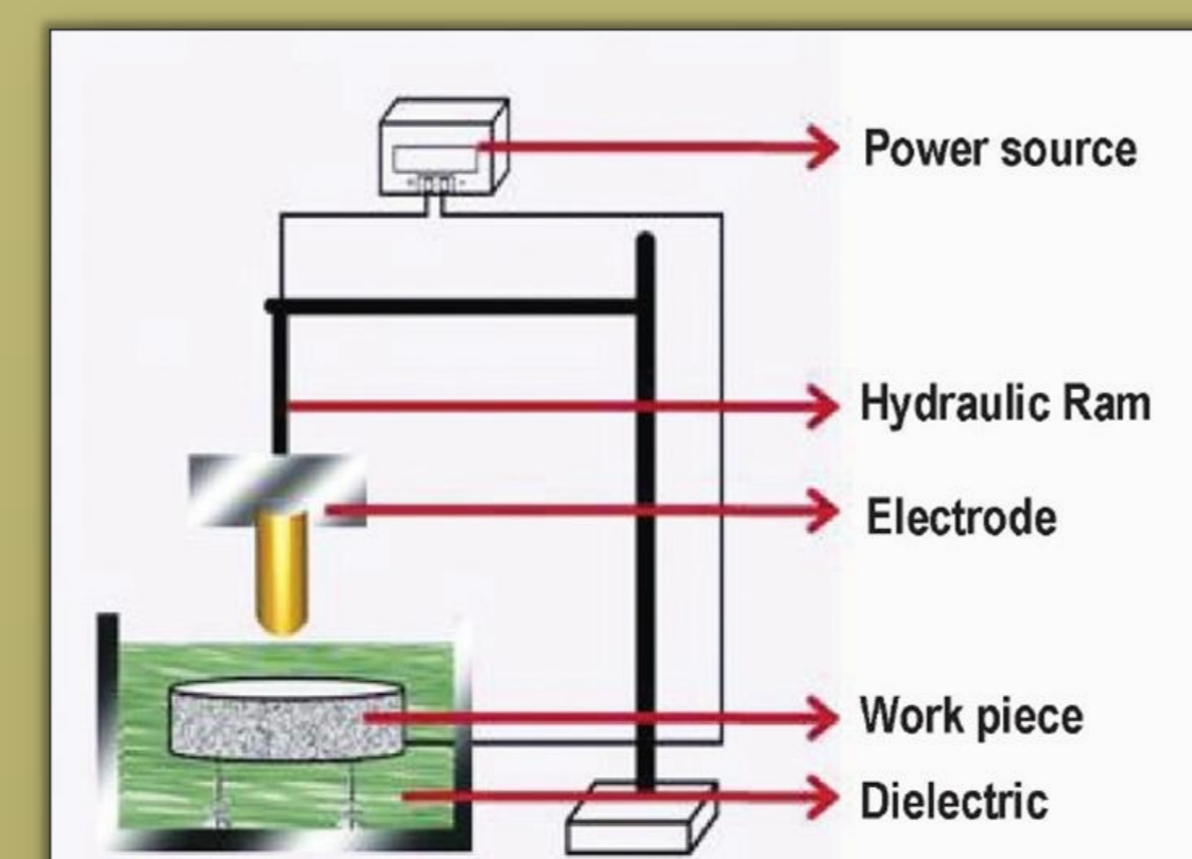
Methods and Materials

An initial cast was produced in a transparent resin material. Five Branemark System implants were arranged in the interforaminal region, and abutments were placed on them with a torque of 20 Ncm. An impression was made using a standard impression technique described by Branemark. A corresponding master cast suitable for the spark erosion post-framework fabrication was produced. From this master cast, 12 frameworks were produced in a conventional single-cast procedure. Six of these were made of a high-gold alloy (Stabilor G); the other 6 were made of pure titanium (Biotan). These frameworks were then refined using the SAE Secotec Spark Erosion System.



To measure the accuracy of the framework fit:

the frameworks were measured before and after the spark erosion treatment using 2 different measurement methods-scanning electron microscopy to measure the gap widths (Sheffield test) and photo elastic stress analysis.



Result

It is a process by which , a metal is precisely contoured into a desired shape by erosion by using accurately controlled electric discharge through two conductive objects immersed in a liquid medium. basically there are two types of EDM-wire and probe type , of which the latter can be effectively used in dentistry. It is used for precise and accurate fabrication in the field of fixed, removable and implant prostheses. Spark erosion technology is a highly advanced system but it has Advantages & Disadvantages like :
Decreased stress on work piece(cooling action of the di-electric fluid), Smooth finish of final restoration, Frameworks with porcelain can be spark eroded without Any stress on the porcelain due to the cooling action of the di-electric fluid, Eroding effect on the corrosion resistance of titanium, Skilled personnel and specialized lab equipment is mandatory, High cost technique.

Conclusion

Using spark erosion technique, the resultant prostheses are retentive and provide a number of benefits offered by both conventional overdenture and fixed prosthetic designs

Reference

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2. Karl, Matthias,et.al, Effect of Material Selection on the Passivity of Fit of Implant-Supported Restorations Created with Computer-Aided Design/Computer-Assisted Manufacture. IJOMI,2011,26(4):739-745.
3. Ricardo Faria Ribeiro,et.al. In vitro comparative analysis of the fit of gold alloy or commercially pure titanium implant-supported prostheses before and after electroerosion,2004,92(2):132-138.

There are more reference because lack of space refuse to mention it .