

Review On Pontics

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Abstract : *A Pontic is a part of fixed partial denture (FPD) which replaces the missing tooth. Various types of pontic designs, and choosing right pontic design depending on several factors which can be critical for success of FPD. Pontics of FPDS fulfill esthetic, mechanical, functional, and hygienic demands but oral hygiene was difficult because of its concave pontic design . Modified ridge lap pontic and the sanitary pontic introduced to minimize or even avoid any contact between the pontic and the mucosa. An ovate pontic is recommended to fulfill esthetic and functional requirements. The aim of this study focuses on evaluating the design in FPD. By reviewing various articles through search engines pubmed, google scholar, journal of science with period or duration consideration from 2000-2020 articles this systematic analysis have been made. This review article gives detailed analysis on the designs and indications, application on each different pontics. Considerable progress has been made in understanding clinical and technical options that are available for fabricating esthetic pontics and to illustrate the practical procedures.*

Key words: *Abutment ; Conical Pontic ; Design principles ; Hygienic Pontic ; Modified ovate Pontic ; Modified ridge lap Pontic ; Ovate Pontic ; Pontics ; Restoration ; Ridge lap Pontic ; Saddle Pontic ; Tooth.Pontics ; Tooth ; Abutment ; Restoration ; conical pontic ; hygienic pontic ; saddle pontic ; ridge lap pontic ; modified ovate pontic ; modified ridge lap pontic ; ovate pontic ; design principles .*

1. INTRODUCTION :

The Pontic or an artificial tooth is the main Component of a fixed partial denture. The pontic is defined as “the artificial tooth suspended from the abutment teeth [1]. In this role, the pontic should restore function, provide esthetics and comfort, be biologically acceptable, permit effective oral hygiene, and preserve underlying residual mucosa [2]. According to the

glossary of prosthodontic terms a pontic is defined as “an artificial tooth on a fixed partial denture that replaces a missing natural tooth restores its functions, and usually fills the space previously occupied by the clinical Crown[3].

Tylman defines pontic as “The suspended member of a fixed partial denture that replaces the lost natural tooth, restores function, and occupies the space of the missing tooth[4]. Resentiel defines pontics as “The artificial teeth of a fixed partial dental Prosthesis that replaces the missing natural teeth, restoring function and appearance. The Pontic, as it mechanically unifies the abutment teeth and covers a portion of the residual ridge, assumes a dynamic role as a component of the prosthesis and cannot be considered a difeleos insert williamhoward leno and Clarence Puri in 1982 gave the standards of pontics design which stated that.

1. Tissue surface of the pontic should be covered for cleaning.
2. Pontics should never have positive pressure on the underlying tissue.
3. Pontics and connectors must be of adequate built to withstand occlusal forces.
4. Pontics should restore esthetics .Commonly used pontic designs are ridge lap pontic; modified ridge lap pontic, sanitary, Conical, and Ovate Pontic[5].

This article reviews the different clinical and technical options that are available for designing esthetic and functional pontics.

2. MATERIALS AND METHODS:

By reviewing various available articles, data were collected through search engines like PUBMED, GOOGLE SCHOLAR ,JOURNAL OF SCIENCE with period consideration 2000-2020. Number of articles were collected based on study setting in both Prospective and retrospective study or case study

Inclusion criteria :

- Various Types of pontic designs
- Treatment planning.
- Various Functional usage of pontics.
- Natural tooth pontics

Exclusion Criteria:

- Other than pontics designs and functional usage.

Pontic Design options:

The majority of researchers studying pontic design assumed that inflammation of the aqveslar mucosa under pontics is caused by accumulation of plaque on the basal Surface of the pontic[6]. As a result, glazed Ceramics were believed to be the material of choice of pontics because of their low rate of plaque accumulation [7].

In retrospective study of partially edentulous patients , 91% of edentulous anterior sections of the Jaw exhibited alveolar defects of various extents [8]. A suitable classification for alveolar ridge defects was provided by scibect[9].

In a survey conducted among patients with FPDS in the maxillary anterior region 20% of the respondents were dissatisfied with the appearance of their denture, and 40% complained about entrapment of food particles [10]. On the wild patients with horizontal defects (class I) satisfied grater subjective satisfaction with their restoration than did these patients whose ridge defect included a vertical component (classes II and III) [11,12]

Conical Pontic: In a study by rich enhech, the conical pontic was used to prevent the extraction site from collapsing after the removal of a tooth and to limitate the natural emergence of the tooth [13]. After extended periods of service, because the adjacent soft tissue tended to become inflamed. And the alveolar bone resorbed [14]. Based on the information available today, these reactions probably occurred because the pontic did not allow adequate oral hygiene [15]. This method is still used in a modified application, the immediate pontic technique, to maintain the topography of the alveolar ridge after extraction of a tooth .

Hygienic Point: The hygienic pontic fulfills the prerequisites for maintaining a healthy periodontium, because it does not come in contact with the underlying soft tissue and provides easy access for oral hygiene aids to clean the abutment tooth[16] . The gap between the pontic and the alveolar ridge, however, is large enough to trap food particles and to allow the tongue to enter [17] because of functional and above all the esthetic and phonetic functional and, above all the esthetic and phonetic draw bacles[18], thus if pontic should be used only in the posterior region of the mandible .

Surface in the concavity [19]. In modified ridge lap, pontics floss can contact more of the tissue surface but concave area remains in the center of the tissue – contacting surface that cannot be cleansed[20]

According to chun – linsteve the following advantages may be observed when using the modified ovals pontic[21]

1. Excellent Aesthetic because it produces a correct emergence profile.
2. Fulfilled case of cleaning compared with ovate pontic.
3. Greater case of cleaning compared with ovate pontic
4. Elimination or minimization of black triangle between the teeth.
5. An effective air seal, which eliminates air or saliva leakage.

Saddle Pontic: The saddle pontic – achieves highly esthetic results, if the alveolar ridges are free of defects [22]. The emergence profile, which is very similar to that of the natural tooth, ensures that no palatal gap forms, which could cause phonetic problems . Today however it is generally agreed that this technique should not be used because the large concave contact area with the alveolar ridge prevents the removal of adherent plaque . In clinical recalls, changes in the soft tissue and severe inflammation including ulceration, are associated with 85% of the saddle ponties.

Ridge lap Pontic: A reduction of the surface area does not significantly improve hygiene underneath the pontic, because the basal contour remains concave, unsuitable to provide a tight contact to the dental floss [23]

Modified ovate Pontic: Live in 2003, the modified ovate pontic design was developed to circumvent the problems encountered with the ovate pontic . In ridge lap pontic dental floss cannot contact the pontic tissue.[24]

Modified ridge lap Pontic: This type of pontic is designed so that the saddle laps over the occlusal side only. The shape, size of the ridge and restoration dictate the lingual design. It

curves in and leaves the lingual ridge exposed . It is fairly esthetic and more cleansable than the full ridge lap pontic[25].

Ovate Pontic: This type is designed to look like an egg or bullet. It is ideal for anterior teeth; however its not limited for posteriors as it is highly esthetic and cleansable . It is developed by a depression created in the residual tissue ridge that mimics the shape of the natural root and Crown. The tooth looks as if it is growing out of the gum tissue and not just resting on top of it , if you demand the best esthetics available, and the least maintenance, the Ovate pontic is the best choice [26].

Pontic Design Principles:

The residual ridge needs to be carefully analyzed for mesio distal width, buccolingual dimension and occlusal cervical distance. To design a pontic that meets hygienic [27]. Requirements and prevents invitation of the tissue, one has to pay attention to the form and shape, the form and shape must incorporate mechanical principles for strength and longevity [28].

Biological Principles:

These include cleansable tissue surface, access to abutment teeth and no pressure on the ridge [29].

Mechanical Principles:

These include strong connectors to prevent fracture, teeth, rigidity to resist deformation and material choice to resist porcelain fracture [30].

Esthetic Principles:

These have to include looking like the tooth it's replacing, appearing to “grow” out of the ridge and have space for porcelain design [31].

Recent Advances in Pontics:

Porous coralline hydroxyapatite blocks implanted in the region Anterior. Several patients improve the pontic or ridge relationship in fixed prosthesis, improving esthetic appearance and oral hygiene performance . The Intervention embrasures can be filled in the maxillary anterior segment using pink porcelain to improve the appearance of the fixed partial denture [32]. The pink porcelain may also be used to solve the esthetic problems Created by moderate ridge resorption and loss of the papilla between pontic and abutment .

Lithium-disilicate glass-ceramic, glass-infiltrated alumina and tetragonal stabilized zirconia are useful for three-unit bridges in present time [33]. In 1998, three-unit bridges made of lithium disilicate glass ceramic were introduced for the replacement of a missing tooth up to the first premolar, where the recommended connector cross-section area is 16 mm. In 2005, an improved press ceramic material called IPS e.max Press was introduced to the market. There are limited data available on IPS e.max Press ceramic [34]. This pressed ceramic is intended to expand the range of indications of Empress 2. While it features similar physical properties as the latter, its translucency has been improved [35]. IPS e.max Press system encompasses a high-stability framework material which consists of lithium disilicate (2 SiO-Li₂O) .[36]The restorations can be customized either by using a layering technique based on fluorapatite glass ceramic or by using the staining technique [37]. As far as it could be

ascertained, there is no study concerning the resistance of implant-supported IPS e.max Press restorations in the literature [38].

As they have aided overcoming several of the limitations encountered with prosthetic solutions, dental implants have become a reliable alternative in the treatment of partial or complete edentulism[39]. Studies evaluating the long-term prognosis of implant-supported restorations have been published [40]. It is well known that the load bearing capacity of bridges depends on the ceramic material's properties, but also to a high extent on the size, shape and position of the connectors, as well as on the span of the pontics, the fabrication technique, the surface finish of the crowns and the luting method.

Pontic designs were well described for situations that require pontics in the fabrication of fixed partial dentures. These designs include: saddle (ridge lap), modified ridge lap, hygienic (sanitary), conical and ovate. Pontics of bridges have to fulfill esthetic, mechanical, functional, and hygienic requests in prosthetic dentistry. Proper design is more important for cleanability and good tissue health than the choice of materials.

When teeth are lost, alveolar resorption and remodeling reshapes the edentulous area. The final healed ridge shape may be an even greater departure from the original configuration. The neighboring and opposite teeth may also be affected from the loss of tooth. The tooth opposite the gap can begin to drift out of its socket. In these cases, modifications must be made in basic tooth morphology for pontic. Stress distributions in a prosthesis can be quite complex. If the pontic design is altered, the characteristic stress pattern can be optimized to improve the survival time of implant-supported all-ceramic bridges.

3. CONCLUSION :

Considerable progress has been made in understanding clinical and technical options that are available for fabricating esthetic pontics and to illustrate the Practical procedure limitations inherent in this study are procedure involved usage of pontics and Recent advances in design and shapes of pontics (less in formation).

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Contributors:

All authors have contributed equally

Conflict of interest :Nil

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Figure 8: Pontic designs

Figures :

Figure 1 - Hygienic pontic[41]

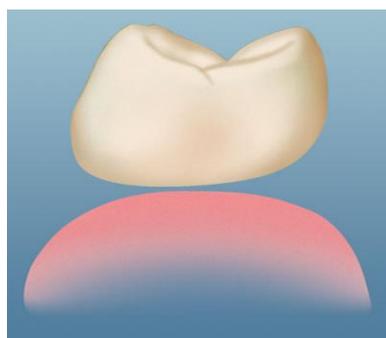
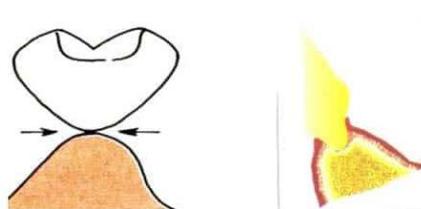


Figure 2 -conical pontic[42]



Conical pontic- placed in extraction site

Figure 3 - saddle pontic[43]

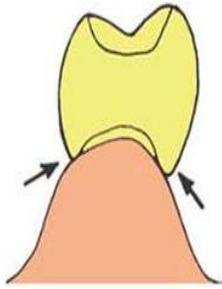


Figure 4- ridge lap pontic[44]

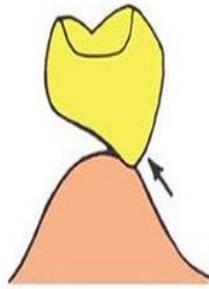


Figure 5 - ovate pontic ([45]
pontic[46]

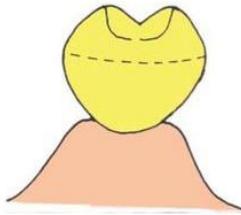


Figure 6 - modified ridge lap

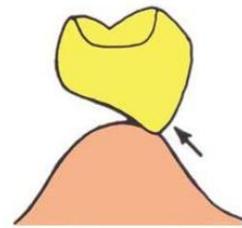


Figure 7 - Modified ovate pontic[47]

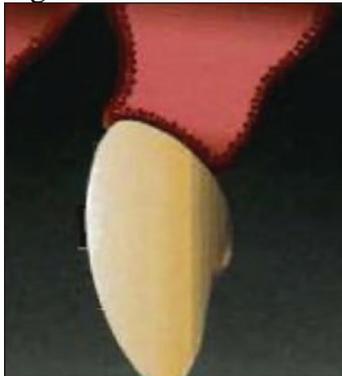


Figure 8 - Pontic designs [48]

