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# The Cognizance of Implant Abutments selection: A Review

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**ABSTRACT:**

***Dental implants have been one of the highly demanding treatment modalities in the field of dentistry since last few decades due to its various benefits such as its longevity, maintaining the integrity of oral tissues and structure and prevention of bone loss. Implant abutments are main components which serves in restoring dental implants. An abutment is that part of a dental implant which assembles a prepared tooth and is designed to be screwed into the implant body. It is the principal component which gives retention to the prosthesis. The parts of implant abutment are – The base, head and the collar. The base is that part of abutment which engages into the internal part of implant. The head acts as a prosthetic retainer and collar connects base and head. Thus, this review article mainly focuses on the implant abutments, its classification and abutment connection.***

**Keywords:** *Dental implants, Abutment, Abutment connection, Implant Abutment*

## I. Introduction:

The role of dental implants in replacing the missing natural tooth has become a common practice in the field of restorative dentistry. Osseointegrated implants has been one of the therapeutic solutions in treating edentulous arches. The success of dental implant highly affects the clinical practice and also encourages patient to accept dental implant. Abutment is primary component which gives retention to the prosthesis. [1] Dental Implant Abutments are the portion that are screwed on the implant connecting the prosthetic Crown with the osseointegrated Implant Body that protrudes through the gingiva, they can be placed with three different approaches namely two-stage method, one-stage method and immediate loading. [8]

**Classification:**

Review of literature reported various types of abutments. They can be classified based on fabrication material, method of connection to the restoration, type of abutment-implant connection, fabrication method, and colour. [3]

**1. Method of connection to restoration**

a) Screw-retained abutment-crown complex
b) Two-piece design with screw-retained crown over the abutment
c) Two-piece design with cemented crown over the abutment

**2. Abutment connection to implant: –**

a) External connection
b) Internal connection

**3. Material –**

a) Titanium - Cast metal (noble, high noble, or base metal alloy)
b) Cast metal with porcelain fused at the base
c) Alumina
d) complete zirconia
e) Zirconia with a titanium base (zirconia-titanium hybrid abutment).

**4. Method of fabrication: -**

a) Prefabricated (unmodified or modified)
b) Customized cast abutment
c) Customized copy-milled abutment
d) Customized CAD-CAM abutment

**5. Colour: –**

a) Gold
b) Silver (metallic finish)
c) Pure white
d) Customized white
e) Customized pink/gingival shade at the cervical region.

**Types of abutments:** [1]

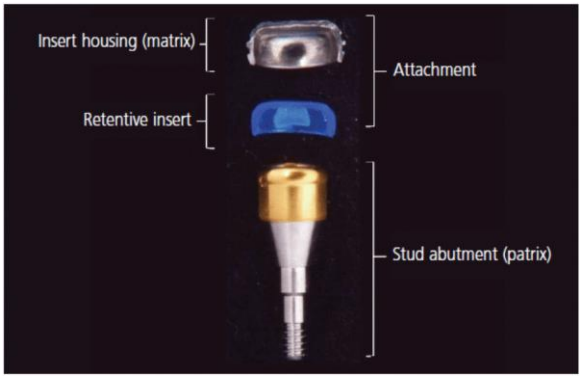
***Standard abutments:*** They are available in different heights and cylindrical in shape. The base is hexagonal in shape and it fits onto the surface of implant fixture. They are also used for fabrication of bone anchored bridges.

***Angulated abutments:*** They have either seventeen degree or thirty-degree angulation to compensate the problems associated with implant angulation. It can be used in multiple implants.

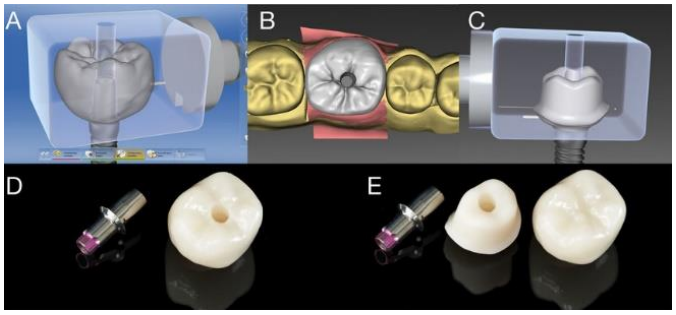
***Ceraone abutments:*** These are mainly pure titanium abutments used for cement-retained restorations. Porcelain is applied to ceramic caps to fabricate all-ceramic single tooth restorations. Temporary or permanent cementation is performed. It is critical to remove excess cement.

***Esthticone abutments:*** These are made of pure Ti with a hexagonal base and are tapered. The three sizes (one, two and three) correspond to the height of the collar in millimetres. They are used for aesthetic restorations, multiple implant screw retained restorations, ceramo-metal and cast metal restorations.

***Over denture abutment:*** Abutments for over denture ball attachments are similar to the standard abutment. The male component is a ball head of the abutment screw and the female component is a plastic cap within denture base. The plastic cap uses rubber O-rings that fit over the abutment screw and provides retention. [10]




***Digital Abutments:*** Using computer software, an ideal abutment shape can be generated and viewed in 3 dimensions10. The implant head impression is made and the working model is placed in a scanner. Readings of implant position and angulation are noted. The position of the gingival margin can be superimposed on the image and sent to a Centre where the abutment is made in Titanium. [10]




**Abutment Designs:**

These include, threaded (straight, prefabricated angled, custom), frictional (press fit, cold welded) and non-threaded (cementable)

**I. Threaded Abutment**

a. **Straight:** Used when axial inclination and parallelism of implants are favourable. Some contain collars (eg. Integral). Some systems require separate Trans epithelial collars (eg. Nobelpharma, IMZ). Calcitek, hexlock and Sterioss abutments have an anti-rotation design.

b. **Pre-fabricated angled:** These are not available from all manufacturers. Implant systems that supply them are Integral, Sterioss, sustain. Implant innovations supplies 15-30 degree angled, one piece, and collared abutments. Steri-oss supplies it in 2 parts, a hexagonal vertical component and a 15–25-degree angled post.

c. **Custom abutments (angled & straight):** They are made by making impressions or by direct resin patterns. Impressions of internal threading of implants are made with a special transfer post. Impressions are removed, analog attached and cast poured. Angulations, those greater than 25 degrees cause excessive force

II. **Frictional / Press fit:** Stryker & Miter blades, supplies this abutment. Straight and angulated variants are available with an angle of 15 degrees.

III. **Non threaded, Cementable:** The system using this modality is the Core- Vent design. Abutment selection will not be required until after 2nd stage of surgery [1]

## Discussion:

With the high rate of implant success for partially edentulous, completely edentulous, and single-tooth restorations the concept of Osseo integrated dental implants is now a highly predictable treatment modality. Several implant abutment designs are constantly evolving to meet aesthetic and functional demands. [5] Increase in aesthetic demand have led to increased use of zirconia abutments. Zirconia abutments not only have advantage of aesthetic appearance but it also showed good adjustments with dental implants. [4] Recently titanium base abutments have been invented to overcome problems of existing abutments such as their unesthetic appearance. Titanium abutments have a specific geometry that is saved in the CAD/CAM system to allow for the fast fabrication of restorations. Once the restoration is milled and has undergone sintering or the crystallization cycle, it is cemented or bonded to the titanium base extra orally and then inserted into the dental implant. [9]

## Conclusion:

There are variety of abutments available based on design, material, method of fabrication and implant abutment connection. The decision of selection of abutment depends on the clinician and his personal preferences. [2] The implant-abutment connection appears to have an influence on the incidence of biological and technical complications. Externally connected abutments encountered more technical problems such as abutment or screw loosening, whereas internally connected abutments were more associated with biologic problem. [7]

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