Dental implants (also known as oral or endosseous implants) have been used to replace missing teeth for more than half a century. They are considered to be an important contribution to dentistry as they have revolutionized the way by which missing teeth are replaced with a high success rate. This article briefly review various types of dental implant systems and treatment options for different types of patients.

**ABSTRACT**

Dental implants (also known as oral or endosseous implants) have been used to replace missing teeth for more than half a century. They are considered to be an important contribution to dentistry as they have revolutionized the way by which missing teeth are replaced with a high success rate. This success depends on the ability of the implant material to integrate with the surrounding tissue.

As the use of dental implants has become much more common, dental personnel are more likely to see patients who have implant-supported/retained restorations. Nevertheless, dental implants are affected by diseases in a similar manner to teeth and may also fail after several months or years in service.

In general, dental implants may be classified as a one- or two-piece implant.

1. **One-piece implant**
   In this type, the implant and the abutment are formed as a single solid unit. In this case, there is no screw-joint between the implant and the abutment. The lack of a screw-joint is considered an advantage as there is no screw-loosening, dangerous fracturing or micro-motions between the abutment and the implant.

   The one-piece implants may be used when narrow implants are indicated, such as in the replacement of the maxillary lateral incisors and lower incisors, or when bone volume is limited and the use of standard implants is not suitable. These types of implants are installed only with the one-stage implant placement method. Examples of a one-piece implant are the one-piece 3.0 Dental Implant® (BioHorizons) and Y-TZP Ceramic Implant® (Nobel Biocare).

2. **Two-piece implant**
   The two-piece implant type consists of an implant to which an abutment or a restoration/attachment is connected, usually with a screw. It is more commonly used than the one-piece implant type. With this implant type, both the one- and the two-stage implant surgery protocol can be implemented.

   Angled implants in which their coronal part is angled in relation to the main implant body are also available. These angled implants are useful in the anterior region when placing non-angled implants in their optimum position is not possible. An example of angled implants is the Co-axial implant (the Southern Implants, UK) in which the neck is at an angle to the long axis of the implant body. It is useful to use when the long axis of a prospective implant is not along the long axis of the potential Restoration.

3. **An implant-supported single restoration**
   When a single tooth is replaced, the restoration is usually either cemented to the abutment or screwed to the implant. This is known as a cement-retained restoration and a screw-retained restoration, respectively. As mentioned earlier, in the cement-retained restoration, the abutment is attached to the implant body through a screw-joint and the restoration is cemented to the abutment in a similar fashion to that which is used in the conventional crown. Therefore, the abutment is used to connect the crown to the implant. In the screw-retained implant restorations, the restoration and the abutment are a single unit which is attached to the implant directly by a screw.

   RISOs may be reduced. For instance, in the case of edentulous ridges, there is no screw-loosening, dangerous fracturing or micro-motions between the abutment and the implant.

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2. **A fixed implant-supported prosthesis (fixed bridge)**
   This is when multiple teeth are missing and replaced with a prosthesis that cannot be removed by the patient. In principle, this type of restoration resembles that described for a single-implant supported crown: cement- or screw-retained restorations.

3. **A removable implant-supported prosthesis**
   In certain clinical situations, multiple missing teeth cannot be restored with a fixed implant-supported restoration. Instead, they are restored with a removable prosthesis which is fundamentally similar to that which is used in replacing a completely edentulous jaw with a removable implant-supported overdenture (RISO). In this case, in addition to the available teeth, one or more implants with attachment systems are usually used.

4. **Implant-supported overdenture for completely edentulous jaws**
   When the jaw is completely edentulous, there are two treatment options for its restoration; namely a fixed or a removable implant-supported overdenture (FISO or RISO). A FISO is when the prosthesis is permanently fixed to the implants through screw-joints between the prosthesis and the implants. This is so it cannot be removed by the patient. The prosthesis is supported by several implants (usually four or more). When such prostheses are indicated, it is a favourable option for many patients. The volume of the prosthesis, and consequently the tissue coverage by the prosthesis, are reduced. However, this type of prosthesis is more expensive than removable ones. It also requires more implants to support and retain the prosthesis.

FISOs are of two basic types: hybrid and porcelain fused to metal. The hybrid prosthesis is made of a metal substructure, acrylic and denture teeth. The porcelain fused to metal prosthesis is made of a metal substructure and porcelain in a similar way to that used in the fabrication of the conventional porcelain-fused-to-metal restoration. It is more expensive than the hybrid and is difficult to make, but it is the better option when the vertical restorative space is limited.
standard of care for an edentulous mandible. (10)-(12) When two-implant supported overdentures are used, the attachments permit movement of the overdenture during function and allow the mucosa of the residual ridge to be involved in dissipating the imposed force.

Dental implants are widely used and considered as one of the options by which missing teeth are replaced. They are used successfully to replace single and multiple missing teeth as well as a completely edentulous jaw. The use of dental implants are increasing and dental professionals are more likely to see patients who have implant-supported restorations/prostheses. Therefore, basic knowledge of dental implants is necessary for dental personnel. Several factors are known to affect success of any implant system. These factors may be related to features locally, such as bone quality and quantity. Other factors are related to the surgical method by which an implant is placed or which are related to the implant system used, such as length and diameter of the implant.

Furthermore, dental implants are affected by peri-implant diseases which, if not treated, can cause the implant to fail. It requires continuous monitoring, regular check-ups and may require professional interventions, the time of intervention being vital.

The success of any implant-supported restoration/prosthesis is dependent on the interaction between the patient and the dental personnel. Therefore, maintaining good oral hygiene and committing to regular check-ups are the responsibility of the patient. On the other hand, it is the responsibility of the dental personnel to examine the implants and the restorations/prostheses clinically and radiographically. It is also the responsibility of the dental practitioner to demonstrate and educate the patient on how to look after the implant and to tailor check-up recall visits according to the patient's needs. Mechanical failures associated with implant-supported restorations/prostheses, such as screw loosening or fracture and chipping of porcelain veneer and fracture of the superstructure, are not uncommon. Loss of retention of the implant-supported overdenture are common clinical findings which may make the patient seek treatment. On the other hand, plaque accumulation and mucosal hyperplasia in the peri-implant site do not necessarily promote the patient to look for treatment.

Consequently, professional evaluation and assessment are required to discover such conditions. This necessitates recall visits and check-ups which allow the dental personnel to intervene in the proper time and to rescue the implant and its restoration/prosthesis. Therefore, the dental personnel should be prepared and able to diagnose and to deal with such complications and to refer the patients when required.

REFERENCES