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Kerator attachment system for implant-supported overdenture: A review of literature

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Abstract

Aim: To evaluate the success rate, level of satisfaction, Retentive force, and Hard and Soft tissue evaluation with implant-supported overdentures with the Kerator® attachment system, by means of a review of the literature.

Materials and Methods: PICO approach was used for the clinical question. The research was conducted in PubMed®, Google scholar®, and Cochrane® information sources using different strategies of text words and MESH terms. Articles were selected for study on kerator attachments.

Results: The evaluation focused on the six papers that met the inclusion and research requirements. The kerator attachment has been compared with various types of attachments. Analysis of studies has shown that difficulties and types of maintenance are related to loss of retention and if loss of retention is seen, then replacement of the nylon male component of the system is required. This article also focused on Patient satisfaction and the evaluation of hard and soft tissues.

Conclusion: Kerator retention system seems to be the best to use with good retention and patient satisfaction, but require maintenance frequency.

Keywords: Prosthodontics, overdentures, denture precision attachment

Introduction

Implant-supported overdenture binding is the advanced treatment in that fasteners improve retention and chewing effectivity and performance of the denture [1-3].

Tooth-Supported dentures have some boundaries due to the strategically positioned abutment tooth, hard and soft tissue supporting the abutment, angulations of abutment teeth, presence of existing caries and loss of attachment, and type of maxillomandibular relationship. The desire of attachments depends truly on the support and the angulation of abutment and interarch space [4, 5]. However, the supported denture offers best support in the case of supervised prognosis because it has its periodontal proprioception [6]. In the case of implant-supported overdenture, the implant provides stable support to the overdenture attachment. Position selection, angulation, and placement are not that important issues because there are various attachments available relative to the thickness, diameter, and length of the implant. This implant-supported denture has a special scope for selecting and customizing attachments in relation to the ridge over the past two decades, the use of prosthetic retention systems in dental implants has yielded significant results for edentulous patients, greatly enhancing their satisfaction and the results of prosthetic rehabilitation [7].

Retention is gained by mechanical connection (e.g. friction, magnetic) between an element contained both in the implant and the prosthesis [8, 9]. There are various attachment systems on the market that differ in form and material, the most popular being the retaining bars and the individual 'ball-type' attachments [10].

The Locator attachment was first discovered in 2001 by 'Zest Anchors' (Escondido, CA, USA), this self-aligning attachment is strong enough and long lasting, wants a low prosthetic space, and has dual retention [11-14]. The 'Kerator' system (Daekwang Co., Seoul, Korea) is a newer version of the 'Zest Anchors' Locator. This kind of attachment is especially designed for patient with lowest vertical space among all other attachments [15].

The ‘Kerator’ attachments consist of 7 different colors of nylon inserts corresponding to different retentive forces. As there is a lack of scientific literature supplying clinical proof of its long-term scientific advantages. The modern-day search for a result objective to have a look at the literature posted related to the Kerator retention system®, the use of the effects evaluated to have a look at its success rating, degree of satisfaction, issues, and sort of maintenance required.



Fig 1: A newer version of the ‘Zest Anchors’ Locator

Material and Methods

A learn about was once made of predominant (PubMed® and Google scholar) and secondary (Cochrane®) sources of information. In PubMed, across the MeSH terms, distinctive

strategies have been used in order to achieve more statistics about oral rehabilitations of overdentures with Locator attachments (Table 1).

Table 1: Show table Keyword Searching and MESH terms & Keyword searching

| Keyword Searching | MESH terms & Keyword searching |
|---------------------------------|--|
| ‘kerator retained overdentures’ | Denture Precision Attachment" [Mesh] and "Dental Implants" AND Kerator. "Denture, Overlay" [Mesh] and "Dental Implants" [Mesh] Not |

By using an amalgam of distinctive lookup strategies, 6 applicable articles have been determined as available. No filtering was used during this research. After reviewing the mentioned articles, a significance analysis was carried.

The following inclusion criteria have been used to select articles for inclusion in this paper:

An in Vivo and in vitro study containing reference to overdentures with Kerator attachment compared with different retention systems.

Containing reference to success rate, degree of satisfaction, Retentive force, and Hard and Soft tissue evaluation.

Summary of articles obtained in the review

Table 3: Show table Study, Design, Retentive force and Strain energy, Patient Satisfaction, Hard and Soft tissue evaluation and Surface wear and deformation

| Study | Design | Retentive force and Strain energy | Patient Satisfaction | Hard and Soft tissue evaluation | Surface wear and deformation |
|-----------------------------------|-------------------|--|--|--|--|
| 1. Nitish Varshney, <i>et al.</i> | An in vivo study | NR | NR | In Kerator attachment had seen decreased Modified Sulcular Bleeding Index and Plaque Index values when compared with bar-and-clip attachment Crestal bone loss was similar in all ball-and-socket attachment, bar-and-clip attachment, and kerator attachment | NR |
| 2. Nitish Varshney, <i>et al.</i> | An in vivo study | Kerator attachment had most retentive capacities than ball and socket attachment and bar and clip attachment. | Patient satisfaction was found to be greater in Kerator attachment when it was compared with ball and socket attachment and bar and clip attachment. | NR | NR |
| 3. Gholamreza Esfahanizadeh | An In Vitro Study | The retentive forces and strain energy of ball attachments was better than Kerator attachments in the vertical and oblique loadings | NR | NR | NR |
| 4. Hani Tohme, <i>et al.</i> | An In Vitro Study | The ‘Kerator’ attachment confirmed greater retention than the new ‘Emi’ attachment. The preliminary retentive capacity of both of them has been decreased. | NR | NR | NR |
| 5. Su-Min Kima, <i>et al.</i> | In vitro study | Kerator showed the best retentive force, discovered with resources of EZ lock and O-ring, after 2500 cycles. | NR | NR | Kerator has been placed to exhibit surface wear and deformation. |
| 6. Tae-Yun Kang | In vitro study | Kerator attachment validated highest retentive loss, followed with the aid of Locator, O-ring, EZ-Lock, and Magnetic attachments after 2250 cycles. | NR | NR | NR |

Results

A total of 7 articles had been discovered as the end result of a variety of unique lookup strategies. After reviewing the abstracts, in accordance with the above-noted inclusion criteria, it was observed that solely six of them fulfilled the pre-established requirements.

Based on the scientific evidence, two had been in vivo studies [16, 17] and 4 have been in vitro studies [18-21] five articles compared retentive forces with different attachments [17-21]. Out of these 5 articles according to three articles retentive pressure was higher with kerator attachment than with Emi attachment, EZ lock, O-ring, ball and socket attachment and

bar and clip attachment [17-19]. Two articles concluded that retentive loss used to be more with kerator than ball, O-ring, EZ-Lock, and Magnetic attachments [20, 21]. Only one find out about in the literature proved that the 'Kerator' attachment reported a greater retention force in assessment to both spherical attachments 'O-ring' and 'EZ lock'; initially, but the place the 'O-ring' attachment had the very best retentive force [15]. The loss of retentive capacity in Kerator attachments is frequently due to the nylon inserts' wear, which desires a periodic follow-up [19]. One article [17] reports data regarding the satisfaction of sufferers subjected to this type of rehabilitation and correlative retentive systems under study, revealing that there is an excessive degree of delight current in all of them.

One article was once about challenging and soft tissue evaluation [16] kerator attachment evaluated lower Modified Sulcular Bleeding Index and Plaque Index values than bar-and-clip attachment. Crestal bone loss was the same in ball-and-socket attachment, bar-and-clip attachment, and kerator attachment and Su-Min Kima, *et al.* compared floor deformation and wear [18]. According to his study floor deformation and wear is considered with kerator attachment.

Discussion

This literature evaluates troubles with prosthetic oral rehabilitations with implant-supported overdentures within the Kerator retention system, focusing on comparisons with different systems, their retentive force, Hard and Soft tissue contrast, their complications, preservation, and patient satisfaction.

The Kerator attachment laptop is a solitary and strong type, comparable to the Locator attachment system. It is convenient to insert and remove and constitutes a dual retention gadget that involves the interior and backyard of a matrix, with the nylon matrix linked to the implant. It consists of a nylon matrix showing different retention forces, permitting basic adjustment of the retention [18].

According to in vivo discovery of Nitish Varshney [17] the resistance towards vertical displacement forces of the denture with kerator attachments is much higher than these of ball socket and bar clip attachments. No retention trouble used to be recorded in the kerator group.

There is sturdy proof that retention is of great magnitude for the patient's pride. The stage of affected person delight used to be evaluated through questionnaires administered to patients, in the main in accordance to an analogic seen scale. This research [17] that cited affected character pride it ought to be referred to that, apart from ordinary satisfaction, patient pride was as soon as increased in Kerator attachment when in contrast with other attachments. Kerator attachment had decreased Modified Sulcular Bleeding Index and Plaque Index than bar-and-clip attachment Crestal bone loss was similar in ball-and-socket attachment, bar-and-clip attachment, and kerator attachment [16]. According to Su-Min Kima, *et al.* As described in the SEM images, the nylon matrix of Kerator exhibited great deformation and deterioration, in various cases in the central core area, in contrast to the outer ring area. The slight retention loss in the Kerator attachment, regardless of the serious deformation and deterioration, is viewed to be consistent with the outer ring is mainly responsible for the retentive force, as an alternative to the significantly deteriorated core [18]. According to the literature consulted the strain energy for the attachments preferred to be described as the highest quality energy for both vertical and oblique loadings that is related to Ball

attachment (4.8 and 4.5 J). The lowest energy strain in vertical loading is for Kerator attachment (1.4 J) and the lowest in oblique loading is for Positioner attachment (1.44 J) [20].

Conclusion

Implant-supported overdentures the use of the Kerator retention device show up to be prosthetic rehabilitations with proper retention. The typical pride charges of sufferers with this retention machine show up to point out it is a workable and captivating scientific option, with the manageability for large-scale future expansion in prosthetic oral rehabilitation. Kerator attachment requires upkeep frequency, in particular with regard to the nylon replacement of the male component. It is necessary to suppose about this factor in the statistics that are given to the affected person when planning their therapy with the use of this system.

The patient ought to be properly informed about the choice to fulfill the quintessential management appointments in order to test oral hygiene and eventual replacement of any retentive elements.

Conflict of Interest

Not available

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Not available

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