Clinical evaluation of implant overdentures using magnetic attachment: retrospective study

Takayama H[1,2], Suzuki Y[1,2], Kurihara D[1,2], Maruo R[1,2], Shimpo H[1,2],Ohkubo C[1,2]

[1)]Dept. of Removable Prosthodontics, Tsurumi University School of Dental Medicine
[2)]Center of Oral and Maxillofacial Implantology, Tsurumi University School of Dental Medicine

Introduction

Implant overdenture (IOD) is one of the most effectiveness treatment for removable denture treatment to provide improvement for removable denture. The objective of this retrospective clinical study was to evaluate performance of IOD using magnetic attachment and to identify risk factors for prosthetic complications.

Materials and Methods

This retrospective study evaluated data collected from edentulous and partial edentulous patients treated April 2003 and November 2018 in Tsurumi University with IOD using magnetic attachment. Outcome measures were implant and prosthetic survival rates, patient age when IOD delivering, ratio of male and female, location and number of implant.

Results

A total of 14 patients (3 males and 11 females) with 42 implants (30 maxilla and 12 mandibular) and 36 magnetic attachments were included in this study.The mean age of these patients was 65.5 years (in a range from 64 to 80 years) (Fig. 1,2). The patients were treated using a conventional 2-loading protocol.

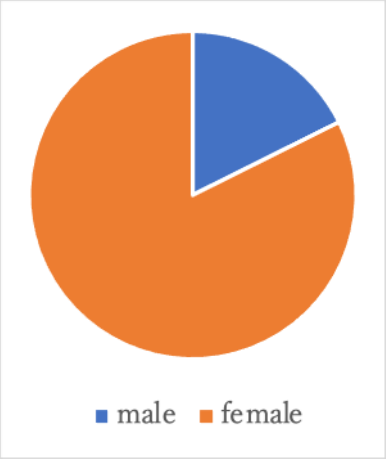


Fig.1 Gender ratio

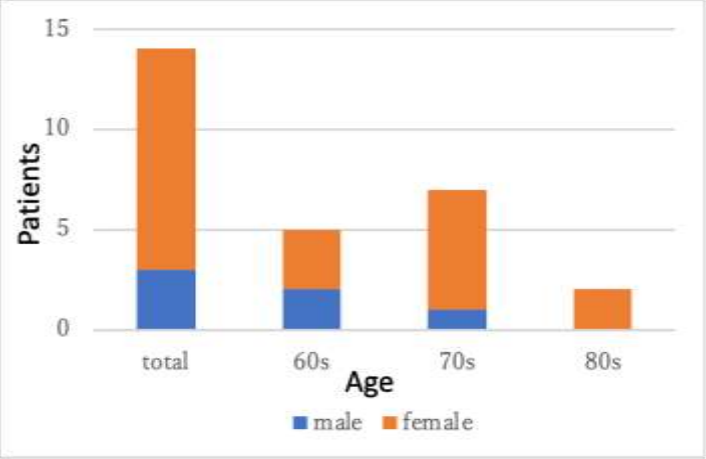
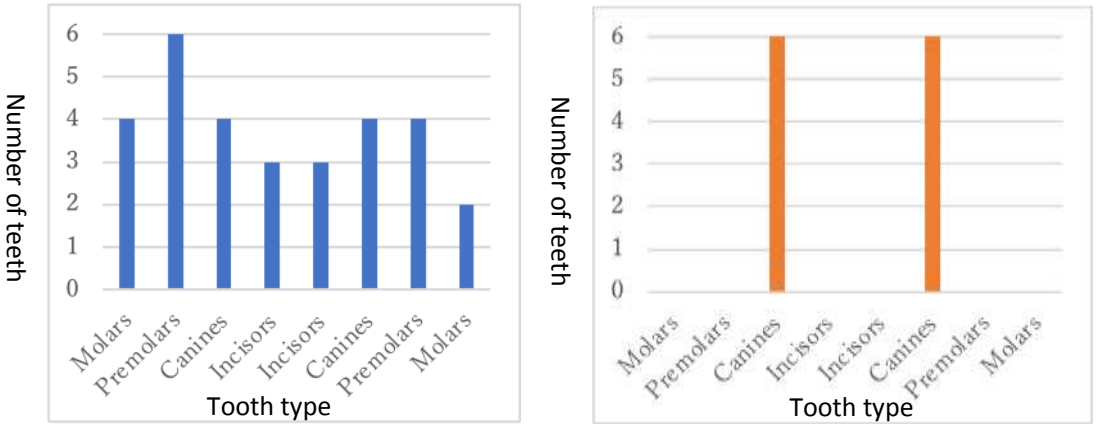


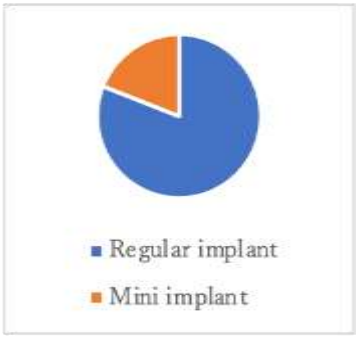
Fig.2 Age Gender

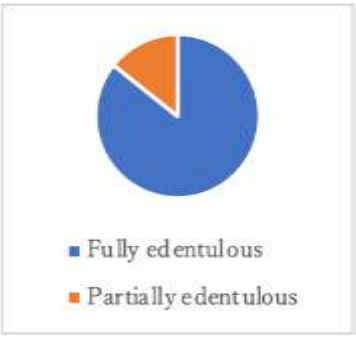
A total of 42 implants were placed, 30 (71,4%) in the maxilla and 12 (28,6%)in the mandible. The positions of implant placement were: incisor (14,3%) ; canine (47,6%) ; premolar (23,8%) and molar(14,3%). In mandibular, a greater number of implants were anterior compared to posterior. (Fig. 3). Two different implant systems were used : 30 implants were regular implants and 12 implants were mini implants(Fig.4). Approximately 2patients (14,3%) were partially edentulous, and 12patients (85,7%) were fully edentulous (Figures 5). The most common denture material was resin base (8 dentures), followed by Co-Cr base (4 dentures) and titanium base (2 dentures) (Fig. 6).



Maxilla Mandibular

Fig.3 The position of Implant placement





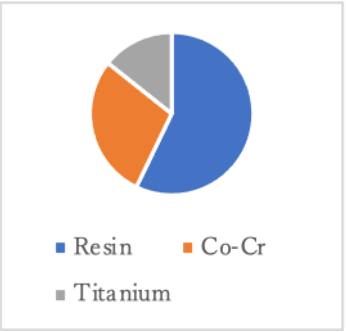


Fig.4 Type of implant Fig.5 Missing teeth situation Fig.6 Denture modalities

One (maxilla incisor) of 42 implants failed because of lack osseointegration, during the 7 years after placement. The implant have functioned at a rate of 97 % (maxilla91,7% mandible 100%). The failed implamt case was no occlusal contact in spite of remaining maxillary and mandibular teeth (Eichner classification C1), which is caused by excessive occlusal force to the implant. In prosthetic complication, attachment loosing (maxillary anterior region and mandibular canine region) were observed 3 patients, during the 1 to7 years after denture delivered. (Figs.8and 9). However some of attachment looseing and detachment may also be attributed to nomal functions, including patient insertion and removal of the prostheses. Therefore, it seems to be impotant that controls for these complication risks be made at regular intervals in clinic.

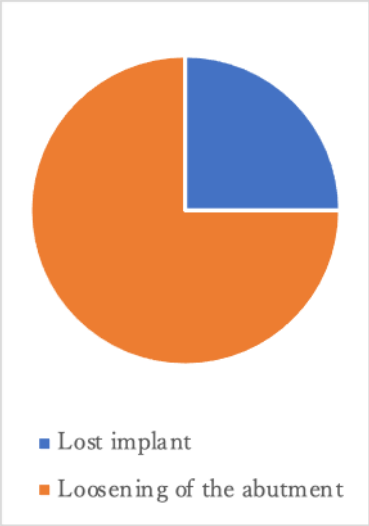


Fig.8 Complication

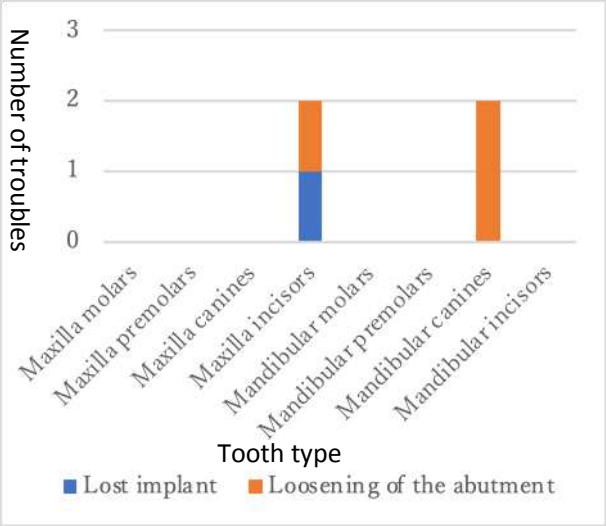


Fig.9 Complication area

Conclusions

In this study, 14 patients (mean age 65.5 years, 3 males and 11 females) with 42 implants and 34 magnetic attachments with a maximum follow-up of 16 years were included. One of 42 implants were failed and attachment loosing were observed 3 patients, but most of the patients were used without any major complaints.The implant over denture with magnetic attachment were exceedingly for rehabilitation with a high survival rate.