

## “Comparative Evaluation of Clinical Application of Monolithic and Folding Implants in Rehabilitation of Elderly Patients with Various Degrees of Atrophy of Alveolar Processes

**Received:** 28 October 2022, **Revised:** 22 November 2022, **Accepted:** 26 December 2022

### **Dr Vaibhav Bhadane.**

Fellowship in Geriatric Dentistry. Govt Dental college and Hospital, Mumbai.  
drvaibhavbhadane@gmail.com (corresponding author)

### **\*Dr Jyoti Tembhurne\*.**

Professor and HOD. Department of Prosthodontics and Crown & Bridge. Government Dental College and Hospital Mumbai.  
jundurware@gmail.com

### **\*Dr Arti Gangurde\***

Associate Professor, Department of Prosthodontics and Crown & Bridge. Government Dental College and Hospital Mumbai.  
docartipg@gmail.com

### **\*Dr Manish Chauhan\*.**

Associate Professor, Department of Prosthodontics and Crown & Bridge. Government Dental College and Hospital Mumbai.  
drmach055@gmail.com

### **\*Dr Niraja Jaiswal\*.**

Associate Professor, Department of Prosthodontics and Crown & Bridge. Government Dental College and Hospital Mumbai.  
drnirajajaiswal@gmail.com

### **\*Dr Ravikumar Akulwar.\***

Assistant Professor, Department of Prosthodontics and Crown & Bridge. Government Dental College and Hospital Mumbai.  
akulwar@gmail.com.

### **Keywords:**

monolithic implants, single-stage implantation, elderly patients, stability index

### **Abstract**

**Aim:** The long-term success rates of single-stage and two-stage surgeries including dental implantation with monolithic and collapsible implants for the rehabilitative treatment of elderly patients were compared and contrasted. **Materials and methods:** Sixty individuals, ages 60 to 70, with a wide range of dentition defect diagnoses, were observed in clinical settings. The research used mechanical oscillatory - resonance, statistical analysis, implant placement using the ART IMPLANT system's non-removable implants, placement of a fixed interim prosthesis, and immediate occlusal functional load are all part of the single-stage surgical procedure. **Results:** Using a single-stage protocol of dental implant surgery and non-detachable implants considerably reduced the time required for surgical phases of treatment and full rehabilitation (p 0.05). **Conclusions:** Therefore, it is important to highlight the system's therapeutic application, To rehabilitate the jaws of elderly patients with variable degrees of alveolar process atrophy, a single-stage surgical approach including the use of non-

detachable (monolithic) dental implants has been developed.

## 1. Introduction

Restorative dental care is in high demand, especially among the older population, according to studies conducted by the World Health Organization (WHO) [1,2].

It is not always viable to rehabilitate this population of patients using conventional procedures due to the adverse clinical circumstances in the oral cavity brought on by atrophic processes happening in the jaws. Orthopedic structures on implants have a higher demand than any other dental service, reports from top-tier European and American research institutes. Moreover, dental implants and bone and plastic materials are the fastest-growing segment of the dental industry's business[2].

Restoration of oral function and appearance may be accomplished using dental implants. It didn't take long for the market to become saturated with a wide variety of implant and implant system options. While choosing an implant system or design, today's practitioner has access to many options. The innovative, one-component designs of dental implants that allow for placement with insufficient bone tissue volume or quality have led to the widespread use of single-stage surgical techniques. Single-stage monolithic implants have a low complication rate and little influence on the jawbone during installation [3,4], which may explain their outstanding success rate in patients with atrophy of the alveolar processes of the jaws. Thus, this study set out to compare the success rates of single-stage and multistage dental implantation procedures, as well as monolithic and collapsible implants, in the treatment of elderly patients requiring rehabilitation.

## 2. Method

Sixty patients with diverse dental defect diagnoses were being closely monitored in the clinic. The diagnostic procedure used the MKH-10 categorization system. Group I (table I) consisted of 20 participants who had sufficient bone volume for dental implant placement; they all underwent a

single-stage surgical protocol that included dental implant placement using non-detachable implants from the Solidum system (ART IMPLANT), a temporary splinting fixed prosthesis, and immediate occlusal functional load[5]. Solidum implants are single-piece, self-tapping devices with a diameter range of 3.2–4.5 millimeters. This implant is placed subcrystallin in a large alveolar ridge due to its design. The bone remodeling process creates an effect similar to a "displaced wound channel," which stops the cervical mucosa from receding and the cortical bone from resorbing before the cervix.

Patients in the second group had insufficient bone volume due to defects in their dentition, dental implants were placed utilizing the ART IMPLANT system's nonremovable Simplex implants, and they were immediately provided with a fixed prosthesis and occlusal function by means of a temporary splint. With its minimally invasive procedure and cylindrical, thin heat-treated neck, the simplex implant (d = 2.8 mm) may be used even when there isn't enough bone volume in the narrow alveolar ridge. 20 persons were in this cohort.

Patients with inadequate bone volume in their jaws were included in the third (comparison) group, which underwent dental implant surgery in two stages using the Virtus (d = 3.5-5.0) detachable implant system (ART IMPLANT). The same number of participants (20) were likewise present in this second group. Dispersal of patients into groups was arbitrary and incidental.

More stable implants have a lower mobility index (IP - PTV), which may be measured on a scale from -8 to +50. We utilized our own questionnaire on a 5-point scale to gauge patients' level of contentment with and emotional response to their therapy. Student's t-test was used to compare several variables in STATISTICA 6.0 and Excel (MS Office 2010, Microsoft, USA) (StatSoft, USA). A p-value of 0.05 was used as the threshold for determining whether or not there were statistically significant differences between the indicators.

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### 3. Results

Men made up 50% of the patients (there were 30 of them), while women made up 50% (there were 30 of them).

Patients with varying degrees of alveolar atrophy and those with acceptable bone volume and quality and straightforward clinical conditions were shown to have a similar index of mobility (IP) of dental implants following surgical implantation and healing (Table I)

The findings of evaluating the mobility index of dental implants in different control groups at various periods are shown in **Table I**.

Research groups	Post-operative	Implant Mobility Index (IMI)						
		1 Week	2 weeks	4 weeks	8 weeks	3 months	6 months	12 months
The first group (sufficient bone volume, one-stage surgical protocol "Solidum")	-5,4	+0,1*	+1,1*	-2,5*	-5,5	-5,4	-6,6	-6,7
The second group (insufficient bone volume, one-stage surgical protocol "Simplex")	-2,7	+1,5*	+2,2*	+1,7*	-0,7	-2,2	-2,5	-3,1
Third (insufficient bone volume, two-stage surgical protocol "Virtus")	+1,6	+4,7*	+7,7*	+3,1*	+3,7*	+1,1	-1,1	-1,5*

Analysis of implantation maps revealed a statistically significant difference in favor of non-detachable (monolithic) implants and one-stage

surgical implantation procedure when comparing the length of time patients needed to be treated between one-stage and two-stage surgical implantation protocols (Table 2).

**Table II.** Depends on the number of dental implants placed and the chosen surgical procedure for their placement.

Average terms of treatment of patients (months)	One-stage implantation protocol		Two-stage implantation protocol
	Non-detachable implants "Solidum" (group 1)	"Simplex" non-detachable implants (group 2)	Collapsible implants "Virtus" (group 3)
Surgical stages of treatment	2,7±0,8**	4,5±0,8**/**	7,3±1,2

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Duration of complete rehabilitation	4,6±0,8**	5,5±1,4*/**	8, 8± 1, 4
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Researchers found that patients' satisfaction with their dental implant surgical procedure and implant type was directly related to how quickly their treatment was completed.

#### 4. Discussion

Several achievements have been achieved via the use of different osteoplastic procedures and materials, but the intricacy, trauma, unpredictability of outcomes, and length of such treatments remain among the most challenging issues. Nowadays, a great deal of clinical experience has been accumulated using one-stage (monolithic) intraosseous dental implants. Extensive randomized studies of long-term outcomes and implant condition, as well as many experimental research of intraosseous implant surface and design variations. Patients were selected at random, Since the same surgeon conducted both procedures under sterile settings, We can clearly attribute the histological process of bone repair after damage to the enhanced MBL detected around implants implanted using a two-stage approach [6]. Rehabilitation with single-stage dental implants for patients with varying degrees of atrophy of the alveolar processes of the jaws is a viable approach that opens the way for prosthetic devices that may restore function. as shown by a review of clinical and experimental evidence. Longevity of permanent prosthesis after single-stage dental implantation is affected by a number of factors, including the stability (mobility) of implants and their dynamics, the objective duration of treatment and its parameters, and the level of patient satisfaction. [7,8].

When it comes to dental implants, the single-stage implantation approach is the gold standard, and the rules of postoperative administration and rehabilitation have been carefully formulated. Primary stability of the implant, as measured by the mechanical oscillatory-resonance method with the Periotest M, was found to be the most important

factor in ensuring a positive treatment outcome (97.2 percent of patients maintained a long-term good functional result of prosthetics), and the index of mobility should be less than or equal to +10.

It was shown that happier patients are associated with shorter treatment times and fewer overall stages. Statistically significant differences (p 0.05) were seen in the time it took to perform each surgical step of therapy and to complete rehabilitation when conventional vs non-collapsible dental implants were used.

#### 5. Conclusion

“Accordingly, In conclusion, it is crucial to note that the clinical use of the one-stage surgical protocol of implantation and non-demountable (monolithic) dental implants of the ART IMPLANT system in the rehabilitation of elderly patients with varying degrees of atrophy of the alveolar processes of the jaws demonstrates implants, shortens the waitinSSg period for permanent prosthetics, and shortens the duration of the entire treatment, ultimately leading to increased optimization of treatment.”

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