

# A Retrospective Analysis Of The Prevalence Of Dental Implant Failure

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## Abstract

**Aim:** The goal of the current study was to identify the prevalence of dental implant failure and the risk factors that affect how well dental implants perform.

**Materials & Methods:** The current retrospective study involved 200 patients of both sexes who had received 302 dental implants. The implant's length, diameter, and location were all noted.

**Results:** In 120 males, 176 dental implants and in 80 females, 126 dental implants were placed. There were 12 (10%) dental implant failures in men and 6 (7.5%) in women. Implant failure was higher with implant length lesser than 10 mm and lesser observed with implant length above 11.5 mm, the difference was statistically significant (0.05). The failure is more with diameter lesser than 3.75 mm.

**Conclusion:** Implants with a smaller diameter and smaller length had higher rates of dental implant failure.

**Key words** Dental implant, failure, Smoker

## Introduction

Dental implants are frequently recommended as a tooth replacement option. A 5-year survival rate of 95% has been deemed successful for implant therapy. The patient-related and dental implant-related factors are just two of the many variables that affect how well dental implant therapy works. However, a number of etiologies, such as biological, mechanical, or iatrogenic factors, may result in the early or late failure of dental implants.<sup>1</sup>

Bone quantity, bone quality, and hidden pathologies are all patient-related factors that are significant. Other elements influencing the outcome of therapy include the patient's overall health and anatomical location.<sup>2</sup> Dental implants may not be used in certain situations. Medical conditions like smoking, diabetes, hypertension, CVDs, etc. have an ongoing impact on the success of dental implant therapy. The success rate of dental implants is influenced by

factors related to dental implants, such as the implant's design, its length, width, and prosthetic components, among others.<sup>3</sup>

Numerous studies have shown different ways to evaluate the survival and success rate of dental implants. A report from the Pisa Consensus Conference of the International Congress of Oral Implantologists (ICOI) suggested that the failure of a dental implant is indicated by mobility, pain during function, or bone loss that exceeds 50% of the implant length.<sup>4,5</sup> According to Albrektsson et al., a dental implant is considered successful implant therapy if there is no mobility, no peri-implant radiolucency, no bone loss after the first year of loading, and no persistent pain, discomfort, or infection.<sup>6</sup> In light of this, the current retrospective study was carried out to ascertain the prevalence rate of dental implants failing after being placed for 5 years.

## Materials & Methods

The department of Prosthodontics was the site of the current 5 years retrospective study. It included 200 patients, both sexes, who received 302 dental implants. The institutional ethical committee gave its approval to the study protocol. Patients with severe periodontal diseases, chronic infectious diseases, immunosuppressive therapy, pregnant women, drug and alcohol users, and patients with hormonal imbalance were excluded from the study.

The department provided dental records for each subject. General data was logged, including name, age, gender, etc. Clinical characteristics and radiographic findings from departmental records were analysed for each patient to record the implant's length, diameter and location.

Any mobility of the dental implant, radiographic evidence of peri-implant radiolucency, any infection, pain, or discomfort, and bone loss greater than 2 mm around the dental implant were considered signs of implant failure based on the patients' recalled information.

The gathered information was evaluated using SPSS version 22 (IBM, Chicago, USA). The failure rate of dental implants was evaluated using a one-way ANOVA test. A P value of 0.05 or less was regarded as statistically significant.

## Results

Table I, shows that in 120 males, 176 dental implants and in 80 females, 126 dental implants were placed. There were 12 (10%) dental implant failures in men and 6 (7.5%) in women, according to Table II. Implant failure was higher with implant length lesser than 10 mm and lesser observed with implant length above 11.5 mm, the difference was statistically significant (0.05) (Table III). Implant failure was higher with smaller diameter of <3.75 and failure rate decreases with diameter >4.5, the difference was statistically significant (0.01) (Table IV).

ANOVA analysis revealed a difference between implant failure based on risk factors that was significantly different (P 0.05).

## Discussion

For the replacement of one or more missing teeth, dental implants are now frequently used.<sup>7</sup> Dentistry has undergone a revolution thanks to dental implant therapy. Different dental surgeons have different options for dental implants. Osseointegration between the dental implant and bone determines the survival rate of the treatment.<sup>8</sup> The limiting factors for dental implant success are bone quality and quantity.<sup>9</sup>

According to Krisam et al. 9.8% of the 186 implants used in 106 patients failed before the final prosthesis. Shorter implants (less than 10 mm) and the need for augmentation procedures were risk factors for early implant failure.<sup>10</sup>

Maximum implant failures (55), according to Raikar et al., were found in people over 60. A 40-year-old age group had 20 failed implants. Dental implants with a length greater than 11.5" (40/700) had the highest failure rates.<sup>11</sup> In comparison to the anterior area, the posterior of the mandible and the back of the mouth had a higher failure rate. In type I bone, there was a 0.3% implant failure rate and 0.8% in type IV bone.

According to Jafarian et al. Canine maxillary areas had the lowest survival, at 2996 days. The implants with the longest survival times were 11 mm long (3179.72 days) and 3.75–4 mm in diameter (3131.161 days), while the implants with the shortest survival times were 11.5 mm long (2317.79 days) and 6.5 mm in diameter (2241.45 days).<sup>12</sup>

According to Wang et al, a cumulative survival rate of 94.6% was achieved with 1 out of 67 replacement implants failing prior to prosthesis delivery and 1 implant failing 20 months after prosthesis delivery.<sup>13</sup> According to Nobre et al's 5-year retrospective study, the risk score for estimating peri-implant disease performed extremely well.<sup>14</sup>

We discovered that failure rate of implants increases with smaller length and smaller diameter. Further studies are needed to validate the results.

## Conclusion

Dental implant failure was high in dental implant with <3.75 mm diameter, dental implant with length <10.0 mm.

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## Legends for illustrations

### Tables

**Table I Distribution of patients**

Gender	Males	Females
Number of patients	120	80
Number of dental implants	176	126

**Table II Prevalence of dental implant failures**

Total	Number	Failure	P value
Males	120	12 (10%)	0.05
Females	80	6 (7.5%)	

One-way ANOVA,  $p < 0.05$ , significant

**Table III Dental implant failure depending on implant length**

Implant length (mm)	Number	Failure	P value
<10	73	11 (15%)	0.05
10-11.5	62	7 (11.3%)	
>11.5	65	1 (1.5%)	

One-way ANOVA,  $p < 0.05$ , significant

**Table IV Dental implant failure depending on implant diameter**

Implant diameter (mm)	Number	Failure	P value
<3.75	68	7 (10.3%)	0.01
3.75-4.5	65	2 (3%)	
>4.5	67	1 (1.5%)	

One-way ANOVA,  $p < 0.05$ , significant