

# Review of Immediate and Delayed Dental Implant Placement in Modern Dentistry

Prayaag Parikh<sup>1</sup>

<sup>1</sup>Western Sierra Collegiate Academy

## ABSTRACT

This literature review contains the overview and comparison of three research articles regarding immediate implants and delayed implants in modern dentistry. With the rise of immediate implants, there are so many factors involved when they are placed during surgery as well as the overall efficiency of the implants. Studies from the three articles are reviewed thoroughly regarding the two main types of implant procedures. Research has shown that immediate implants have various benefits such as shorter treatment time and psychological benefit to the patient. For delayed implants, studies have proven that these implants contain a higher success rate with fewer post-operant complaints. There are many benefits and downsides to each of the options, and this review explores immediate and delayed dental implants while comparing them to one another in modern dental surgeries. The main results of the research was the immediate implants can be more useful and efficient than delayed implants when used properly in dental surgeries and also being well planned ahead of time. Though delayed implants have a higher success rate than immediate implants in tissue, immediate implants get the job done faster and can be a better option when it is well placed.

## **Introduction**

Delayed implants are placed after a certain period of time (usually after a few weeks and even up to months) after tooth removal. This used to be the typical option for implant placement in a patient. On the other hand, immediate implants are placed within the patient's area of injury as soon as the extraction is completed. This is a newer implant placement approach that dentists and oral surgeons now prefer. Implant placement in fresh sockets was first reported by Schulte and Heimke in 1976, termed 'immediate implant.' Before that time, implants were always delayed, meaning that it would take multiple surgeries to place the implant including healing time after the initial surgery. This review will discuss the benefits and disadvantages of using immediate implants and delayed implants.

Furthermore, based on the sources analyzed, this review will opionate on the best implant technique option to use in present-day surgery. In the dental review "Immediate Implant Placement: Positives and Negatives," the authors emphasize that immediate implants have positive benefits to the patients, such as satisfying psychology, faster healing time, and better tissue health around the tooth; however, the negatives can be that immediate implants have higher failure rates. In the dental article, "Immediate and Delayed Implant Placement Into Extraction Sockets: A 5-Year Report," the authors performed a five-year study that clearly demonstrates that having immediate implants for five years does not result in the loss of tissue, just like the delayed implant; it is imperative to know that tissue failure, in the long run, is inevitable in both the maxilla and mandible regardless of the implant type. In the dental article, "Immediate versus delayed implant placement after anterior single tooth extraction: the timing randomized controlled clinical trial," the authors prove over a clinical experiment that IMI (immediate implants) are not feasible nor recommended in dental surgery due to their failure in bone healing and overall health of tissue.

## **Article #1- Immediate Implant Placement: Positives and Negatives**

This article discusses the pros and cons of immediate implants. “One study reported an overall decrease of 4.0 mm in ridge height and 25% loss of total bone volume occurred within 1 year post extraction. This same study reported that the volume of bone loss increased 40% to 60% in 3 years.” There is a loss of bone volume when delayed implants are placed. A long extraction period leads to ridge height decrease and bone volume loss. The loss continues for up to three years. This shows the inconsistency and the failure of the healing process that delayed implants have. It isn’t as coherent as immediate implants. Immediate implants heal efficiently when the procedure is done correctly. “The main advantages of the immediate approach are reduced number of surgical procedures and shortened overall treatment time when compared to delayed implant placement. In addition, there is a psychological benefit for patients by replacing a tooth loss with an implant simultaneously. However, there is higher risk for implant failure, unpredictable future hard and soft tissue levels, and difficulty to achieve implant stability.” However, some of the downsides of immediate implants are direct failure of the implant itself and difficulty achieving implant stability in the patient’s mouth. Although there are various benefits to immediate implants, there are some flaws. “Quiryne et. al. reviewed implant survival after immediate implant placement. Implant loss was between 0% and 40%, with a mean of 6.2%. There was a higher survival rate when the implants were submerged. Some studies compared immediate versus delayed, and no conclusions could be drawn regarding which had a higher survival rate.” The conclusion of Quiryne’s study is presented: more implant loss. But there was a survival rate when implants were submerged, which is a sign of success. However, according to the article’s conclusion, there is no definite answer on which is better. As expressed, the main positive sides of immediate implants are the psychological benefit and faster healing time, while the downsides are implant failure and patient risk.

## **Article #2-Outcome of Early Dental Implant Placement Versus Other Dental Implant Placement Protocols: A Systematic Review and Metaanalysis**

According to the article, “Implant placement following complete soft tissue coverage of the extraction socket (within 3–8 weeks of tooth extraction) was considered as the early implant placement. Delayed implant placement was defined as implant placement 12 weeks or more after tooth extraction. Immediate implant placement was defined as implant placement into a fresh extraction socket immediately after tooth extraction.” Early dental implant placement, such as immediate implants, provides a benefit in enhancing the soft tissue post-extraction. “The number of failed implants was eight for the early placement protocol and 23 for the immediate placement protocol, resulting in overall implant survival rates of 95.88% (186/194) for the early placement and 93.80% (348/371) for the immediate placement protocols.” This means that early implant protocols did slightly better than immediate implant placement. However, there is a higher margin of error for early implant placement because there is significantly less testing in the sample size. Therefore, no definitive conclusions can be made about which of these two implants are better. In the article, the authors mentioned that “Present findings indicate that the early implant placement protocol results in implant outcomes similar to immediate and delayed placement protocols and a superior stability of peri-implant hard tissue compared with immediate implant placement.” This is a difference between the early implants and the immediate implants. The hard tissue stability varies once the implant is inserted after extraction in the socket. The article also regards peri-implant bone loss by stating, “Significantly lower marginal peri-implant bone loss was found for implants placed according to the early placement protocol compared with those placed immediately into fresh extraction sockets.” Peri-implant diseases are connected with inflammation in the mouth with both hard and soft gum, and early implants prove to decline the frequency of those diseases. Therefore, we can infer that early implant placement prevents inflammation of the gums more efficiently than immediate placement in the fresh extraction sockets. The article also explains that “Promising clinical outcomes have been reported for a modification of the early placement protocol

where implants were placed 10 days after extraction. Schropp and colleagues have shown comparable clinical outcomes between this protocol and the delayed implant placement protocol after 5-years and 10-year follow-up periods.” All in all, Article 2 dived into the tissue and gum portion of immediate and early implant protocol, concluding that early implants have a higher efficiency rate than do immediate implants with intraoral gum health post-extraction.

### Article #3- Immediate versus delayed implant placement after anterior single tooth extraction: the timing randomized controlled clinical trial

This article accentuates the failure and uncertainty of immediate implants when used in a surgery due to the implant instability within a clinical experiment conducted. “A composite wound failure index comprising wound dehiscence, oedema, and suppuration over the first six post-operative weeks was calculated. Wound failure was five times more frequent at immediately placed implants. Patient post-operative complaints also had a tendency towards higher frequency at immediate implant sites.” Wound failure is more frequent in immediate implants. This information comes from a post-operative study in the article.

	Immediate (%)	Delayed (%)	Significance
Need for bone augmentation	72	43.9	p=0.01
Primary Wound Closure	61.7	82.1	p=0.05
Wound Failure	26.1	5.3	p=0.02
Patient post-op complaints	18.9	4.9	p=0.06

**Figure 1.** Comparison of surgical outcomes in the test and control groups. Immediate percentages, delayed percentages, and the p value for the sample test comparison are recorded in the experiment.

The figure 1 sums up the study that happened between delayed and immediate implants. The immediate implants had more of a failure because of wound damage, complaints, and need for bone augmentation. Delayed implants performed better in all categories. “It seems that, in spite of careful soft tissue handling with microsurgical materials and the application of papilla preservation flaps, immediate implant placement carries a higher degree of surgical risk.” IMI contains a surgical risk because of the biomaterials, the wound closure, and the overall implant failure. Without careful planning ahead of time, immediate implants threaten the patient. Indeed, they can be very dangerous when the area of injury is severe; if the immediate implants are not inserted correctly, the healing will not be efficient or as desired. All in all, this article clearly sided with the fact that immediate implants increase wounds, thereby having less of a positive impact than delayed implants. According to the experiment conducted within this review, the delayed implants were the winner.

## Discussion

Each article mentions that the immediate implants have a higher chance of failure, although the healing time is quicker. Additionally, the delayed implants may have a slower overall process, but the implants are efficient when inputted after surgery. Article 1 demonstrates that immediate implants can definitely be used in actual surgery when there is planning prior to the procedure. However, article 3 is strictly against immediate implants since patients have a high chance of wound failure and postoperative complaints. These differences show the various points of view dentists have on implant integration. Some prefer delayed, while others prefer immediate. The experiments and studies pertaining to the research in each article support one implant type over the other. Article 1 and 2 prefer immediate implant (in certain conditions), while Article 3 prefers delayed implant.

## Conclusion

Immediate implants are used popularly in modern dentistry as a new surgical method. With a quicker procedure, faster healing time, and psychological benefit, immediate implants have revolutionized dental implant surgery. Although delayed implants have a more efficient healing process and less probability of implant failure, they are not used as widely today in dental surgeries. Evolution in technology has definitely made Immediate Implant Placement the treatment of choice for most dentists. Successful Immediate implant placement surgery requires more planning compared to Delayed implant surgery. Additionally, when choosing Immediate Implant Placement, it is best practice to have a conversation with the patient about the benefits versus the risks of Immediate implants.

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