

ORIGINAL RESEARCH

Assessment of effect of platelet-rich fibrin on extraction socket healing in diabetic patients

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Received: 16 July, 2022

Accepted: 19 December, 2022

ABSTRACT

Background: Diabetes mellitus is the most frequently encountered endocrine disorder. The present study was conducted to assess effect of platelet-rich fibrin on extraction socket healing in diabetic patients. **Materials & Methods:** 50 patients of type II diabetics undergoing dental extraction of two or more teeth of both genders were divided into 2 groups of 25 each. In group I, the socket was packed with PRF and sutured, and in group II, the socket was sutured without packing. Soft-tissue healing (assessed by colour, bleeding on palpation, granulation tissue, and incidence of suppuration and dry socket) and visual pain scores were assessed. **Results:** Group I had 12 males and 13 females and group II had 14 males and 11 females. Reddish pink colour at 1 week was seen in 40% and 25%, at 3 weeks in 92% and 57% and at 6 weeks in 100% and 85% in group I and II respectively. Bleeding at 1 week was seen in 45% and 80%, at 3 weeks in 10% and 56% and at 6 weeks in 0% and 15%. Suture margin dehiscence at 1 week was seen in 24% and 48%, at 3 weeks in 0% and 11%. Suppuration at 1 week was seen in 5% and 16%, at 3 weeks in 0% and 7%. Pain at 1 week was 5.6 and 6.4, at 3 weeks was 1.2 and 4.3 and at 6 weeks was 0.3 and 2.5 in group I and II respectively. **Conclusion:** Both hard-tissue healing and soft-tissue healing were found to be better in the sockets containing PRF.

Key words: Diabetes mellitus, PRF, suture

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INTRODUCTION

Diabetes mellitus is the most frequently encountered endocrine disorder in the world. The International Diabetes Federation has estimated that 415 million people in the world currently suffer from diabetes; this figure of patients is expected to reach 642 million by 2040, and one person of 11 is diabetic.¹ It is a well-known fact that diabetics are prone to impaired wound healing. It has been stated that wound healing is impaired due to several reasons.²

Among the available options for reducing post-operative symptoms and preserving post-extraction sockets are autologous platelet concentrates (APCs). The most popular of such haemocomponents are platelet-rich plasma (PRP), plasma rich in growth factors (PRGF) and platelet-rich fibrin (PRF).³ A common feature to all of these APCs is the higher than baseline concentration of platelets, which has been shown to play an important role in tissue healing. Their effectiveness lies in the continuous and local release of a wide range of growth factors, which meet the needs of the physiological process of wound

healing and tissue repair. Growth factors are biological mediators capable of regulating cellular events, such as migration, cell proliferation and differentiation in addition to synthesis of extracellular matrix.⁴

The placement of platelet-rich fibrin (PRF) in the healing site delivers platelet-derived growth factors, which has been shown to reduce bleeding and stimulate soft tissue and bone regeneration in extraction sockets.⁵ The present study was conducted to assess effect of platelet-rich fibrin on extraction socket healing in diabetic patients.

MATERIALS & METHODS

The present study consisted of 50 patients of type II diabetics undergoing dental extraction of two or more teeth of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. All underwent extraction. Following extraction, patients were divided into 2 groups of 25 each. In group I, the socket was packed with PRF and sutured, and in

group II, the socket was sutured without packing. The primary outcome measures were soft-tissue healing (assessed by color, bleeding on palpation, granulation tissue, and incidence of suppuration and dry socket), hard-tissue healing (measured by visual interpretation,

area of bone coverage, and grayscale analysis), and visual pain scores. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Groups	Group I	Group II
Method	PRF	Control
M:F	12:13	14:11

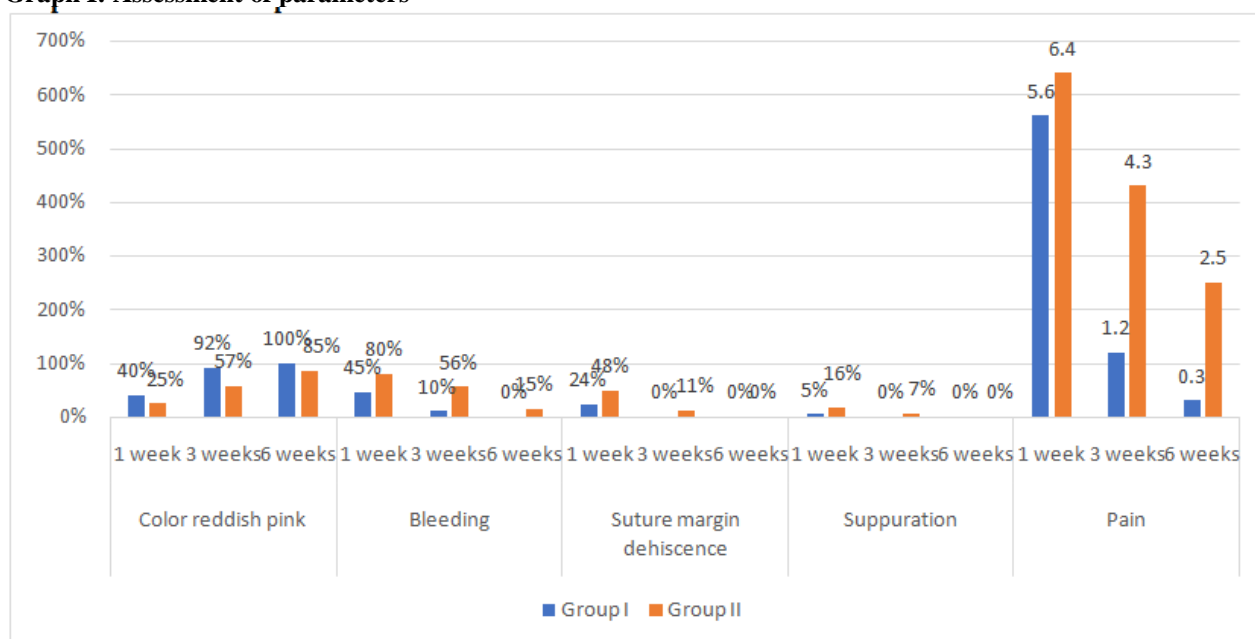
Table I shows that group I had 12 males and 13 females and group II had 14 males and 11 females.

Table II: Assessment of parameters

Parameters	variables	Group I	Group II	P value
Color reddish pink	1 week	40%	25%	0.01
	3 weeks	92%	57%	0.03
	6 weeks	100%	85%	0.05
Bleeding	1 week	45%	80%	0.01
	3 weeks	10%	56%	0.02
	6 weeks	0%	15%	0.04
Suture margin dehiscence	1 week	24%	48%	0.02
	3 weeks	0%	11%	0.01
	6 weeks	0%	0%	1
Suppuration	1 week	5%	16%	0.05
	3 weeks	0%	7%	0.01
	6 weeks	0%	0%	1
Pain	1 week	5.6	6.4	0.82
	3 weeks	1.2	4.3	0.04
	6 weeks	0.3	2.5	0.05

Table II, graph I shows that reddish pink color at 1 week was seen in 40% and 25%, at 3 weeks in 92% and 57% and at 6 weeks in 100% and 85% in group I and II respectively. Bleeding at 1 week was seen in 45% and 80%, at 3 weeks in 10% and 56% and at 6 weeks in 0% and 15%. Suture margin dehiscence at 1 week was seen in 24% and 48%, at 3 weeks in 0% and 11%. Suppuration at 1 week was seen in 5% and 16%, at 3 weeks in 0% and 7%. Pain at 1 week was 5.6 and 6.4, at 3 weeks was 1.2 and 4.3 and at 6 weeks was 0.3 and 2.5 in group I and II respectively.

Graph I: Assessment of parameters



DISCUSSION

Tooth extraction is one of the most frequent procedures in oral and maxillofacial surgery, and is related to consistent physiological changes to the alveolar process.⁶ The main extraction-related postoperative symptoms affecting soft tissues and patient quality of life are pain, bleeding, trismus and swelling.⁷ Other postoperative complications are delayed healing and infection. Hard tissues are also affected: tooth extraction always triggers a process of bone resorption.⁸ The alveolar ridge undergoes progressive atrophy, which is more severe in the bucco-lingual dimension than in the apico-coronal dimension.^{9,10} Most of the resorption process occurs during the first 6 months of the post-extraction period, although it continues throughout the patient's life time.¹¹ The present study was conducted to assess effect of platelet-rich fibrin on extraction socket healing in diabetic patients.

We found that group I had 12 males and 13 females and group II had 14 males and 11 females. Asoka et al¹² evaluated the effectiveness of platelet-rich fibrin (PRF) in post-extraction socket healing in diabetic patients. Both soft-tissue healing and hard-tissue healing were significantly better in the experimental socket as compared to the control socket. Pain levels, as measured by the visual analog score, were similar in both the extraction sockets.

We found that reddish pink color at 1 week was seen in 40% and 25%, at 3 weeks in 92% and 57% and at 6 weeks in 100% and 85% in group I and II respectively. Bleeding at 1 week was seen in 45% and 80%, at 3 weeks in 10% and 56% and at 6 weeks in 0% and 15%. Suture margin dehiscence at 1 week was seen in 24% and 48%, at 3 weeks in 0% and 11%. Suppuration at 1 week was seen in 5% and 16%, at 3 weeks in 0% and 7%. Pain at 1 week was 5.6 and 6.4, at 3 weeks was 1.2 and 4.3 and at 6 weeks was 0.3 and 2.5 in group I and II respectively. Del Fabbro et al¹³ determined the effectiveness of APC adjunct in the preservation of fresh extraction sockets. Thirty-three comparative studies were included. Nine articles had a parallel design and 24 had a split-mouth design. Twenty studies were considered at low risk of bias and 13 at high risk. 1193 teeth were extracted in 911 patients. Meta-analysis showed that soft tissue healing, probing depth at 3 months and bone density at 1, 3 and 6 months were statistically better for APC group. Analysis suggested that APCs may be associated with a reduction in swelling and trismus. However, no significant difference among groups was found regarding probing depth at 1 month, incidence of alveolar osteitis, acute inflammation or infection, percentage of new bone and indirect measurement of bone metabolism.

Aronovich et al¹⁴ observed 115 diabetic patients who required dental extractions, and attempted to detect an association between the rate of postextraction epithelialization and glycemic control status. They stated that there was no statistically significant

association between post-extraction epithelialization and preoperative blood glucose levels.

The limitation the study is small sample size.

CONCLUSION

Authors found that both hard-tissue healing and soft-tissue healing were found to be better in the sockets containing PRF.

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