

Effect of Platelet-Rich Fibrin on Neurosensory Recovery Following Bilateral Sagittal Split Osteotomy: A Randomized, Participant- and Assessor-Blinded, Split- Mouth Clinical Trial

Farnoosh Razmara

Tehran University of Medical Sciences

Abolfazl Razi Avarzamani

dr.abolfazlrazi@gmail.com

Tehran University of Medical Sciences

Narges Hajiani

Tehran University of Medical Sciences

Mohammad Javad Kharazifard

Tehran University of Medical Sciences

Zahra Alsadat Emami Meybodi

Qazvin University of Medical Sciences

Research Article

Keywords: Platelet-Rich Fibrin, Neurosensory Recovery, Paresthesia, Inferior Alveolar Nerve, Bilateral Sagittal Split Osteotomy, Orthognathic Surgery, Randomized Clinical Trial

Posted Date: October 19th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10950025/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Background

Neurosensory disturbance (NSD) of the inferior alveolar nerve is a common complication following bilateral sagittal split osteotomy (BSSO). Platelet-rich fibrin (PRF) is an autologous platelet concentrate containing a fibrin matrix and bioactive mediators that may support tissue repair and peripheral nerve recovery. This study evaluated the effect of locally applied PRF on neurosensory recovery following BSSO.

Methods

This randomized, split-mouth clinical trial included 16 patients with skeletal Class II or Class III mandibular deformities undergoing BSSO. Using computer-generated randomization, PRF was applied to one osteotomy site in each patient before fixation, while the contralateral site served as the untreated control. Participants and the examiner responsible for postoperative neurosensory assessment were blinded to treatment allocation. Neurosensory function was assessed at 3 and 6 months postoperatively using directional brush-stroke discrimination, two-point discrimination, and temperature discrimination. Patient-reported neurosensory disturbance was assessed using a visual analogue scale (VAS). Paired t-tests were used for continuous outcomes, and McNemar's test was used for the categorical temperature-discrimination outcome.

Results

At 3 months, PRF-treated sides demonstrated significantly better directional brush-stroke discrimination than control sides (8.56 ± 1.59 vs. 7.00 ± 2.63 ; $P = 0.003$). Two-point discrimination was also significantly better on PRF-treated sides (6.94 ± 0.64 vs. 8.69 ± 0.66 mm; $P < 0.001$), as were VAS scores for perceived neurosensory disturbance (3.00 ± 0.56 vs. 4.81 ± 0.50 ; $P < 0.001$). Similar differences were observed at 6 months for directional brush-stroke discrimination (9.69 ± 0.60 vs. 8.50 ± 2.22 ; $P = 0.018$), two-point discrimination (5.88 ± 0.66 vs. 7.19 ± 0.71 mm; $P < 0.001$), and VAS scores (1.94 ± 0.42 vs. 3.13 ± 0.52 ; $P < 0.001$). Temperature discrimination was significantly better on PRF-treated sides at 3 months ($P = 0.016$), but the difference was not statistically significant at 6 months ($P = 0.250$).

Conclusions

Within the limitations of this split-mouth randomized clinical trial, local application of PRF was associated with improved neurosensory outcomes at 3 and 6 months following BSSO. The findings suggest that PRF may accelerate postoperative neurosensory recovery, particularly during the early recovery period. Larger trials with longer follow-up are required to determine whether PRF influences long-term sensory recovery.

Trial registration

Background

Bilateral sagittal split osteotomy (BSSO) is one of the principal surgical procedures used for correction of mandibular skeletal deformities, including mandibular retrognathism and prognathism. Despite its widespread use and established clinical effectiveness, neurosensory disturbance (NSD) involving the inferior alveolar nerve remains one of the most common and clinically relevant postoperative complications. The reported incidence of sensory alteration following sagittal split osteotomy varies substantially among studies, partly because of differences in surgical techniques, patient characteristics, methods of neurosensory assessment, and duration of follow-up [1–4].

Several patient- and procedure-related factors have been associated with postoperative NSD, including age, fixation technique, surgical approach, unfavorable splitting, magnitude of mandibular displacement, surgeon experience, and the anatomical relationship between the inferior alveolar nerve and the osteotomy site [5].

Platelet-rich fibrin (PRF) is an autologous platelet concentrate in which platelets and leukocytes are incorporated into a three-dimensional fibrin matrix. This fibrin architecture may act as a reservoir for growth factors and other bioactive mediators and may support angiogenesis, cellular migration, inflammation modulation, and tissue repair [6,7]. These properties have led to increasing interest in PRF as a regenerative adjunct in oral and maxillofacial surgery.

The potential role of platelet concentrates in peripheral nerve regeneration has also been investigated. Experimental studies have suggested that platelet-derived mediators may contribute to neuroprotection, angiogenesis, modulation of the inflammatory response, and axonal regeneration [8_10]. Clinically, PRF has been investigated in procedures involving peripheral nerve injury, including inferior alveolar nerve lateralization and genioplasty, with findings suggesting a potential beneficial effect on neurosensory recovery [11,12].

A randomized split-mouth clinical trial by Tabrizi et al. reported improved neurosensory recovery following local application of PRF during sagittal split osteotomy [13]. More recent clinical studies have continued to investigate platelet concentrates as adjuncts for improving sensory recovery following mandibular osteotomy [14,15]. However, the available clinical evidence remains limited, and further randomized studies using standardized neurosensory assessments are warranted.

Therefore, the present study aimed to evaluate whether local application of PRF during BSSO improves postoperative neurosensory recovery compared with an untreated contralateral osteotomy site. We hypothesized that PRF application would result in improved neurosensory outcomes during postoperative follow-up.

Methods

Study design and setting

This study was designed as a randomized, split-mouth clinical trial with a 1:1 allocation of the two osteotomy sites within each participant to PRF treatment or untreated control. Each participant contributed one PRF-treated osteotomy site and one contralateral control site. The study was conducted among patients referred to the Department of Oral and Maxillofacial Surgery, School of Dentistry, Tehran University of Medical Sciences, for surgical correction of mandibular skeletal deformities at Shariati and Sina Hospitals.

The split-mouth design allowed each participant to contribute one PRF-treated osteotomy site and one untreated contralateral control site.

The study was approved by the Ethics Committee of Tehran University of Medical Sciences under ethics code **IR.TUMS.DENTISTRY.REC.1404.039** on 9 July 2025. All participants provided written informed consent before enrollment.

The trial was registered on August 30, 2025 in the Iranian Registry of Clinical Trials (IRCT) under registration number **IRCT20250815066858N1**.

The study was conducted in accordance with the principles of the Declaration of Helsinki.

This randomized clinical trial was conducted and reported in accordance with the Consolidated Standards of Reporting Trials (CONSORT) guidelines.

No important changes were made to the trial design, eligibility criteria, interventions, outcome measures, or statistical analysis methods after trial commencement.

Participants

Sixteen patients (50% male and 50% female) with skeletal Class II (18.8%) or Class III mandibular deformities who were scheduled to undergo bilateral sagittal split osteotomy (BSSO) were assessed for eligibility and enrolled in the study. All participants were aged 16 to 36 years or old at the time of enrollment. Patient recruitment and surgical procedures were conducted between May 31, 2025, and August 21, 2025. All 16 participants were randomized, with each participant receiving platelet-rich fibrin (PRF) treatment at one randomly allocated osteotomy site, while the contralateral site served as the untreated control. All 16 participants completed the 3- and 6-month follow-up assessments and were included in the final analysis. No participants were lost to follow-up, discontinued the intervention, withdrew from the study, or were excluded after randomization.

The trial was completed as planned after the enrollment and follow-up of 16 participants. The trial was not stopped early for reasons related to efficacy, harm, futility, or other interim findings.

Inclusion criteria

Participants were eligible if they:

1. had a skeletal Class II or Class III mandibular deformity; and
2. were scheduled to undergo BSSO as part of their orthognathic surgical treatment.

Exclusion criteria

Participants were excluded if they had:

1. previous mandibular trauma;
2. previous orthognathic surgery or genioplasty;
3. intraoperative partial or complete transection of the inferior alveolar nerve or other clinically evident nerve trauma;
4. failure to identify the inferior alveolar nerve during BSSO;
5. an unfavorable or bad split during surgery;
6. a history of medication use for psychiatric disorders; or
7. withdrawal of informed consent or unwillingness to continue participation.

Randomization and blinding

A split-mouth randomization design was used, with one osteotomy site allocated to PRF treatment and the contralateral site serving as the untreated control.

The randomization sequence was generated using Randomizer App version 11.0.0 by the surgeon, who was not involved in the postoperative neurosensory assessments. The randomization sequence determined whether the right or left osteotomy site received PRF, while the contralateral site served as the control. Simple randomization was used to allocate the PRF treatment to either the right or left osteotomy site. No restriction was applied to the randomization sequence.

PRF was applied to the randomized treatment site following completion of the osteotomy and before fixation. No PRF was applied to the contralateral osteotomy site.

Because the surgeon was required to know the treatment allocation to apply PRF, the surgical operator could not be blinded to allocation. Participants and the examiner responsible for postoperative neurosensory assessment were blinded to the treatment allocation. The outcome assessor was not involved in the surgical procedure.

Because PRF was applied only to the randomized treatment site, the interventions were not identical. The surgical technique and fixation method were standardized between the two osteotomy sites.

Sample size calculation

Sample size estimation was performed using PASS version 11 based on the findings of a previous study by Tabrizi et al. [13].

With an alpha level of 0.05, a beta of 0.20, an estimated standard deviation of 0.95 mm for two-point discrimination, and a clinically relevant difference of 1 mm, a minimum of 16 paired observations was estimated.

Because of the split-mouth design, 16 participants were enrolled, with each participant contributing one PRF-treated and one control osteotomy site.

All 16 randomized participants were included in the primary analysis. Because of the split-mouth design, each participant contributed one PRF-treated osteotomy site and one contralateral control site. All randomized participants were analyzed according to their assigned treatment allocation.

Surgical procedure

All BSSO procedures were performed using a standardized surgical technique and the same fixation method.

The inferior alveolar nerve was identified during surgery, and unnecessary manipulation or significant trauma to the nerve was avoided. Patients in whom an unfavorable or bad split occurred were excluded from the study according to the predefined exclusion criteria.

Following completion of the osteotomy, the mandible was positioned in the planned postoperative position. The proximal and distal segments were subsequently stabilized using miniplates and monocortical screws.

Preparation and application of PRF

Before surgery, 20 mL of venous blood was collected from each participant and immediately transferred to an IntraSpin centrifuge system (Intra-Lock International, Boca Raton, FL, USA).

The samples were centrifuged for 12 min at 28,000 rpm.

After centrifugation, three layers were obtained: an acellular plasma layer at the top, a fibrin clot in the middle, and red blood cells at the bottom. The fibrin clot was separated and applied to the randomized treatment osteotomy site before fixation.

Figure 1

Figure 2

Neurosensory assessment

Neurosensory function was assessed at 3 and 6 months postoperatively using objective clinical sensory tests and a patient-reported assessment.

The same examiner, who was blinded to treatment allocation, performed the postoperative neurosensory assessments.

Directional brush-stroke discrimination

Directional brush-stroke discrimination was evaluated using a fine No. 2 sable brush. The brush was applied across the lower lip and chin in anterior and posterior directions. Participants were asked to identify the direction of movement.

The number of correctly identified stimuli was recorded.

Two-point discrimination

Two-point discrimination was assessed using a blunt-tipped gauge. The minimum distance at which the participant could distinguish two separate points was recorded in millimetres.

Lower values indicated better sensory discrimination.

Temperature discrimination

Temperature discrimination was assessed using ethyl chloride spray applied to a cotton swab. The participant's ability to detect the thermal stimulus was recorded as a categorical outcome.

Patient-reported neurosensory disturbance

Participants rated their perceived degree of numbness using a 10-point visual analogue scale (VAS). Higher scores indicated greater perceived neurosensory disturbance.

Outcomes

The primary outcome was postoperative neurosensory recovery assessed by two-point discrimination at 3 months after BSSO. Secondary outcomes included directional brush-stroke discrimination, temperature discrimination, and patient-reported neurosensory disturbance assessed using a visual analogue scale (VAS). All outcomes were assessed at 3 and 6 months postoperatively. For two-point discrimination, lower values indicated better sensory discrimination. For directional brush-stroke discrimination, higher scores indicated better sensory performance. For the VAS, higher scores indicated greater perceived neurosensory disturbance.

Outcomes were compared between the PRF-treated and contralateral control sites at 3 and 6 months following surgery.

No changes were made to the prespecified primary or secondary outcome measures after the trial commenced.

Statistical analysis

Statistical analyses were performed using SPSS version 21 (IBM Corp., Armonk, NY, USA).

No interim analyses were planned or performed, and no formal stopping guidelines were specified.

Continuous outcomes were compared between PRF-treated and control sides using paired t-tests. Temperature discrimination, which was analyzed as a categorical outcome, was compared using McNemar's test.

A two-sided P value < 0.05 was considered statistically significant.

No prespecified subgroup analyses or additional exploratory analyses were performed.

Ethical considerations

The study was approved by the Ethics Committee of Tehran University of Medical Sciences under ethics code **IR.TUMS.DENTISTRY.REC.1404.039** on 9 July 2025.

Written informed consent was obtained from all participants before enrollment.

The clinical trial was registered in the Iranian Registry of Clinical Trials under registration number **IRCT20250815066858N1**.

The study was conducted in accordance with the Declaration of Helsinki.

Adverse events

No adverse events specifically attributable to the local application of PRF were observed or reported during the study period. No participant discontinued the intervention because of an adverse event.

Results

Participant flow and baseline characteristics

Sixteen participants were included in the split-mouth analysis. Each participant contributed one PRF-treated osteotomy site and one untreated contralateral control site.

Directional brush-stroke discrimination

At 3 months, the mean number of correctly identified brush-stroke directions was significantly higher on PRF-treated sides than on control sides (8.56 ± 1.59 vs. 7.00 ± 2.63 ; $P = 0.003$).

At 6 months, the corresponding values were 9.69 ± 0.60 and 8.50 ± 2.22 , respectively ($P = 0.018$).

The results are summarized in Table 1.

Two-point discrimination

At 3 months, the mean two-point discrimination distance was significantly lower on PRF-treated sides than on control sides (6.94 ± 0.64 vs. 8.69 ± 0.66 mm; $P < 0.001$).

At 6 months, the corresponding values were 5.88 ± 0.66 and 7.19 ± 0.71 mm, respectively ($P < 0.001$).

The results are summarized in Table 2.

Patient-reported neurosensory disturbance

At 3 months, the mean VAS score was significantly lower on PRF-treated sides than on control sides (3.00 ± 0.56 vs. 4.81 ± 0.50 ; $P < 0.001$).

At 6 months, the mean VAS score remained significantly lower on PRF-treated sides than on control sides (1.94 ± 0.42 vs. 3.13 ± 0.52 ; $P < 0.001$).

The results are summarized in Table 3.

Temperature discrimination

At 3 months, temperature detection was more frequent on PRF-treated sides than on control sides (15 vs. 8; $P = 0.016$).

At 6 months, no statistically significant difference was observed between the groups (16 vs. 13; $P = 0.250$).

The results are summarized in Table 4.

Overall neurosensory recovery

Overall, significant between-side differences were observed for directional brush-stroke discrimination, two-point discrimination, and patient-reported neurosensory disturbance at both postoperative assessment points.

The magnitude of the between-side difference appeared to decrease over time, suggesting that spontaneous sensory recovery occurred in both the PRF-treated and control sites.

No adverse events specifically attributable to the local application of PRF were reported in the available study data.

Discussion

The present randomized split-mouth clinical trial demonstrated that local application of PRF during BSSO was associated with improved neurosensory outcomes at both 3 and 6 months after surgery. Significant differences favoring PRF were observed for directional brush-stroke discrimination, two-point discrimination, and patient-reported neurosensory disturbance. Temperature discrimination was also significantly better on PRF-treated sides at 3 months, although this difference was no longer statistically significant at 6 months.

Neurosensory disturbance of the inferior alveolar nerve is a well-recognized complication of BSSO. Previous studies have reported substantial rates of temporary and persistent sensory alterations following mandibular sagittal split osteotomy [2–4,16,17]. Recovery is influenced by multiple patient- and procedure-related factors, including age, surgical technique, the anatomical relationship of the nerve to the osteotomy, magnitude of mandibular movement, and surgical experience [5].

The split-mouth design represents an important methodological strength of this study. Because both treatment conditions were evaluated within the same participant, several patient-level characteristics, including age, sex, systemic characteristics, overall surgical environment, and postoperative care, were inherently controlled. Random allocation of the treatment side further reduced the potential for systematic side-related allocation bias.

The present findings are consistent with previous clinical evidence suggesting a possible beneficial role of PRF in neurosensory recovery following mandibular surgery. Tabrizi et al. reported improved neurosensory recovery following PRF application during sagittal split osteotomy [13]. More recently, a randomized clinical trial reported improved sensory recovery following PRF application during BSSO [16]. In addition, a recent double-blind, split-mouth randomized clinical trial investigating advanced PRF reported improved two-point discrimination following sagittal split ramus osteotomy [17].

The biological rationale for a potential effect of PRF on peripheral nerve recovery is plausible. The fibrin matrix provides a three-dimensional scaffold capable of retaining platelets and growth factors at the surgical site. Platelet-derived mediators may contribute to angiogenesis, cellular migration, modulation of inflammation, and tissue regeneration [10–12]. These effects could potentially create a local biological environment that supports recovery following surgical trauma involving the inferior alveolar nerve.

An important finding of the present study was that the difference between the PRF-treated and control sides was less pronounced at the later follow-up for some sensory outcomes. This observation may indicate that PRF primarily accelerates the process of neurosensory recovery rather than necessarily producing a permanent difference in final sensory function. Spontaneous recovery of inferior alveolar nerve function following BSSO is well documented, particularly during the early postoperative period [14,15].

The temperature-discrimination findings are compatible with this interpretation. PRF was associated with significantly better temperature detection at 3 months, whereas the difference was not statistically

significant at 6 months. The convergence of sensory outcomes over time may reflect progressive spontaneous recovery in the untreated control sites and not treatment the condition.

The use of multiple neurosensory assessment methods is another strength of the study. Objective sensory testing and patient-reported symptoms may not always provide identical information. Combining directional discrimination, two-point discrimination, temperature discrimination, and subjective assessment provides a broader evaluation of postoperative sensory function [18–20]. The consistency of the findings across several outcomes supports the possibility of an early beneficial effect of PRF.

Nevertheless, the findings should be interpreted in light of several limitations.

First, follow-up was limited to 6 months. Consequently, the present study cannot determine whether PRF has an effect on long-term or permanent neurosensory recovery.

Second, although the split-mouth design controls for many participant-level confounders, anatomical differences between the right and left inferior alveolar nerves may still influence sensory recovery.

Third, the study did not include histological or electrophysiological assessments. Therefore, the clinical findings cannot establish whether PRF directly promotes structural nerve regeneration or primarily modifies the local healing environment and duration of postoperative sensory symptoms.

Finally, because the surgeon had to know the treatment allocation in order to apply PRF, surgical blinding was not possible. However, participant and outcome-assessor blinding reduced the potential for performance and assessment bias.

Future multicenter randomized clinical trials with larger sample sizes and longer follow-up are warranted. Standardized quantitative sensory testing, electrophysiological assessments, and patient-reported outcome measures may provide additional information regarding the biological and clinical effects of PRF on inferior alveolar nerve recovery.

Conclusions

Within the limitations of this randomized split-mouth clinical trial, local application of PRF during BSSO was associated with improved neurosensory outcomes at 3 and 6 months after surgery.

The most consistent benefits were observed in directional brush-stroke discrimination, two-point discrimination, and patient-reported neurosensory disturbance. PRF may therefore have the potential to accelerate postoperative neurosensory recovery following BSSO, particularly during the early recovery period.

However, the present findings do not establish whether PRF improves long-term permanent sensory recovery. Larger randomized clinical trials with longer follow-up and standardized quantitative or

electrophysiological assessments are needed.

List of abbreviations

BSSO: Bilateral sagittal split osteotomy

NSD: Neurosensory disturbance

PRF: Platelet-rich fibrin

VAS: Visual analogue scale

RCT: Randomized clinical trial

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Tehran University of Medical Sciences under ethics code IR.TUMS.DENTISTRY.REC.1404.039 on 9 July 2025. All participants were aged 16 years or older and provided written informed consent to participate before enrollment. No participants younger than 16 years were included in the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding authors upon reasonable request, subject to applicable ethical and institutional restrictions.

Protocol availability

The study protocol is available from the corresponding authors upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This study was funded by the authors' personal financial resources. The funders had no role in the study design, data collection, analysis, interpretation of the results, or decision to submit the manuscript for publication.

Authors' contributions

FR: study conception, patient recruitment, data collection, manuscript preparation.

NH: patient recruitment, clinical procedures, data collection, manuscript review.

ARA: study conception and design, surgical supervision, clinical procedures, interpretation of findings, manuscript review and revision.

MJK: statistical methodology, data analysis, interpretation of results, manuscript review.

ZAE: study conception and design, supervision, neurosensory assessment, interpretation of results, manuscript preparation and critical revision.

All authors read and approved the final manuscript and agree to be accountable for all aspects of the work.

Acknowledgements

The authors thank all patients who participated in the clinical trial and the clinical staff involved in patient care and data collection.

Trial registration

Iranian Registry of Clinical Trials (IRCT), **IRCT20250815066858N1**.

References

1. Al-Bishri A, Barghash Z, Rosenquist J, Sunzel B. Neurosensory disturbance after sagittal split and intraoral vertical ramus osteotomy: as reported in questionnaires and patients' records. *Int J Oral Maxillofac Surg*. 2005;34(3):247–251.
2. Jääskeläinen SK, Peltola JK, Lehtinen R. The mental nerve blink reflex in the diagnosis of lesions of the inferior alveolar nerve following orthognathic surgery of the mandible. *Br J Oral Maxillofac Surg*. 1996;34(1):87–95.
3. Kuroyanagi N, Miyachi H, Ochiai S, et al. Prediction of neurosensory alterations after sagittal split ramus osteotomy. *Int J Oral Maxillofac Surg*. 2013;42(7):814–822.
4. Agbaje JO, Salem AS, Lambrichts I, Jacobs R, Politis C. Systematic review of the incidence of inferior alveolar nerve injury in bilateral sagittal split osteotomy and the assessment of neurosensory disturbances. *Int J Oral Maxillofac Surg*. 2015;44(4):447–451.
5. Kobayashi A, Yoshimasu H, Kobayashi J, Amagasa T. Neurosensory alteration in the lower lip and chin area after orthognathic surgery: bilateral sagittal split osteotomy versus inverted L ramus osteotomy. *J Oral Maxillofac Surg*. 2006;64(5):778–784.
6. Dohan Ehrenfest DM, Rasmusson L, Albrektsson T. Classification of platelet concentrates: from pure platelet-rich plasma to leucocyte- and platelet-rich fibrin. *Trends Biotechnol*. 2009;27(3):158–167.

7. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, et al. Platelet-rich fibrin: a second-generation platelet concentrate. Part I: technological concepts and evolution. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2006;101(3):e37–e44.
8. Farrag TY, Lehar M, Verhaegen P, Carson KA, Byrne PJ. Effect of platelet-rich plasma and fibrin sealant on facial nerve regeneration in a rat model. *Laryngoscope*. 2007;117(1):157–165.
9. Ikumi A, Hara Y, Yoshioka T, Kanamori A, Yamazaki M. Effect of local administration of platelet-rich plasma on peripheral nerve regeneration: an experimental study in the rabbit model. *Microsurgery*. 2018;38(3):300–309.
10. Sánchez M, Garate A, Delgado D, Padilla S. Platelet-rich plasma, an adjuvant biological therapy to assist peripheral nerve repair. *Neural Regen Res*. 2017;12(1):47.
11. Khojasteh A, Hosseinpour S, Nazeman P, Dehghan MM. The effect of a platelet-rich fibrin conduit on neurosensory recovery following inferior alveolar nerve lateralization: a preliminary clinical study. *Int J Oral Maxillofac Surg*. 2016;45(10):1303–1308.
12. Behnia P, Behnia H, Ghanbari AM, Tabrizi R. Does leucocyte- and platelet-rich fibrin enhance neurosensory recovery after genioplasty? A double-blind, split-mouth, randomised clinical trial. *Br J Oral Maxillofac Surg*. 2023;61(8):534–539.
13. Tabrizi R, Pourdaneh F, Jafari S, Behnia P. Can platelet-rich fibrin accelerate neurosensory recovery following sagittal split osteotomy? A double-blind, split-mouth, randomized clinical trial. *Int J Oral Maxillofac Surg*. 2018;47(8):1011–1014.
14. Hegde P, Shetty V, Badrinath S. Role of platelet-rich fibrin in neurosensory recovery following bilateral sagittal split osteotomy: a randomized control trial. *J Craniomaxillofac Surg*. 2024;52(11):1390–1393. doi:10.1016/j.jcms.2024.02.015.
15. Comprehensive evaluation of advanced platelet-rich fibrin in common complications following sagittal split ramus osteotomy: a double-blind, split-mouth, randomized clinical trial. *Int J Oral Maxillofac Surg*. 2025;54(2):134–142. doi:10.1016/j.ijom.2024.03.005.
16. Schultze-Mosgau S, Krems H, Ott R, Neukam FW. A prospective electromyographic and computer-aided thermal sensitivity assessment of nerve lesions after sagittal split osteotomy and Le Fort I osteotomy. *J Oral Maxillofac Surg*. 2001;59(2):128–138.
17. Becelli R, Renzi G, Carboni A, Cerulli G, Gasparini G. Inferior alveolar nerve impairment after mandibular sagittal split osteotomy: an analysis of spontaneous recovery patterns observed in 60 patients. *J Craniofac Surg*. 2002;13(2):315–320.
18. Teerijoki-Oksa T, Jääskeläinen S, Forssell K, Virtanen A, Forssell H. An evaluation of clinical and electrophysiologic tests in nerve injury diagnosis after mandibular sagittal split osteotomy. *Int J Oral Maxillofac Surg*. 2003;32(1):15–23.
19. Westermarck A, Englesson L, Bongenhielm U. Neurosensory function after sagittal split osteotomy of the mandible: a comparison between subjective evaluation and objective assessment. *Int J Adult Orthod Orthognath Surg*. 1999;14(4):268–275.

20. Politis C, Sun Y, Lambrichts I, Agbaje JO. Self-reported hypoesthesia of the lower lip after sagittal split osteotomy. *Int J Oral Maxillofac Surg.* 2013;42(7):823–829.

Tables

Table 1. consort table

CONSORT stage	Description	n
Enrollment	Assessed for eligibility	16
	Excluded	0
Allocation	Randomized	16
	Allocation of treatment side by computer-generated randomization	16
	PRF side	16 sides
	Control side	16 sides
Follow-up	Lost to follow-up at 3 months	0
	Lost to follow-up at 6 months	0
	Discontinued intervention	0
Analysis	Analyzed at 3 months	16 patients / 16 sides per group
	Analyzed at 6 months	16 patients / 16 sides per group

Table 2. Directional brush-stroke discrimination at 3 and 6 months after BSSO

Time point	PRF-treated side, mean $\pm$ SD	Control side, mean $\pm$ SD	P value
3 months	8.56 $\pm$ 1.59	7.00 $\pm$ 2.63	0.003
6 months	9.69 $\pm$ 0.60	8.50 $\pm$ 2.22	0.018

Table 3. Two-point discrimination at 3 and 6 months after BSSO

Time point	PRF-treated side, mm, mean $\pm$ SD	Control side, mm, mean $\pm$ SD	P value
3 months	6.94 $\pm$ 0.64	8.69 $\pm$ 0.66	<0.001
6 months	5.88 $\pm$ 0.66	7.19 $\pm$ 0.71	<0.001

Table 4. Patient-reported neurosensory disturbance assessed using the VAS

Time point	PRF-treated side, mean $\pm$ SD	Control side, mean $\pm$ SD	P value
3 months	3.00 $\pm$ 0.56	4.81 $\pm$ 0.50	<0.001
6 months	1.94 $\pm$ 0.42	3.13 $\pm$ 0.52	<0.001

Table 5. Temperature discrimination at 3 and 6 months after BSSO

Time point	PRF-treated side, n	Control side, n	P value
3 months	15	8	0.016
6 months	16	13	0.250

Figures



Figure 1
Placement of PRF over the inferior alveolar nerve (IAN)



Figure 2

PRF preparation

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [consort.docx](#)