

World Journal of *Clinical Cases*

World J Clin Cases 2021 April 6; 9(10): 2160-2418



MINIREVIEWS

- 2160 Tertiary peritonitis: A disease that should not be ignored
Marques HS, Araújo GRL, da Silva FAF, de Brito BB, Versiani PVD, Caires JS, Milet TC, de Melo FF
- 2170 SARS-CoV-2, surgeons and surgical masks
Khalil MI, Banik GR, Mansoor S, Alqahtani AS, Rashid H

ORIGINAL ARTICLE

Case Control Study

- 2181 Igaratimod promotes transformation of mononuclear macrophages in elderly patients with rheumatoid arthritis by nuclear factor- κ B pathway
Liu S, Song LP, Li RB, Feng LH, Zhu H

Retrospective Study

- 2192 Factors associated with overall survival in early gastric cancer patients who underwent additional surgery after endoscopic submucosal dissection
Zheng Z, Bu FD, Chen H, Yin J, Xu R, Cai J, Zhang J, Yao HW, Zhang ZT
- 2205 Epidemiological and clinical characteristics of 65 hospitalized patients with COVID-19 in Liaoning, China
Zhang W, Ban Y, Wu YH, Liu JY, Li XH, Wu H, Li H, Chen R, Yu XX, Zheng R
- 2218 Comprehensive clinicopathologic characteristics of intraabdominal neurogenic tumors: Single institution experience
Simsek C, Uner M, Ozkara F, Akman O, Akyol A, Kav T, Sokmensuer C, Gedikoglu G
- 2228 Distribution and drug resistance of pathogens in burn patients in China from 2006 to 2019
Chen H, Yang L, Cheng L, Hu XH, Shen YM

Observational Study

- 2238 Impact of simethicone on bowel cleansing during colonoscopy in Chinese patients
Zhang H, Liu J, Ma SL, Huang ML, Fan Y, Song M, Yang J, Zhang XX, Song QL, Gong J, Huang PX, Zhang H

Prospective Study

- 2247 Effect of suspension training on neuromuscular function, postural control, and knee kinematics in anterior cruciate ligament reconstruction patients
Huang DD, Chen LH, Yu Z, Chen QJ, Lai JN, Li HH, Liu G

CASE REPORT

- 2259 Turner syndrome with positive SRY gene and non-classical congenital adrenal hyperplasia: A case report
He MN, Zhao SC, Li JM, Tong LL, Fan XZ, Xue YM, Lin XH, Cao Y

- 2268** Mechanical thrombectomy for acute occlusion of the posterior inferior cerebellar artery: A case report
Zhang HB, Wang P, Wang Y, Wang JH, Li Z, Li R
- 2274** Bilateral retrocorneal hyaline scrolls secondary to asymptomatic congenital syphilis: A case report
Jin YQ, Hu YP, Dai Q, Wu SQ
- 2281** Recurrent undifferentiated embryonal sarcoma of the liver in adult patient treated by pembrolizumab: A case report
Yu XH, Huang J, Ge NJ, Yang YF, Zhao JY
- 2289** Adult onset type 2 familial hemophagocytic lymphohistiocytosis with *PRF1* c.65delC/c.163C>T compound heterozygous mutations: A case report
Liu XY, Nie YB, Chen XJ, Gao XH, Zhai LJ, Min FL
- 2296** Salvage of vascular graft infections *via* vacuum sealing drainage and rectus femoris muscle flap transposition: A case report
Zhang P, Tao FL, Li QH, Zhou DS, Liu FX
- 2302** Innovative chest wall reconstruction with a locking plate and cement spacer after radical resection of chondrosarcoma in the sternum: A case report
Lin CW, Ho TY, Yeh CW, Chen HT, Chiang IP, Fong YC
- 2312** Changes in sleep parameters following biomimetic oral appliance therapy: A case report
Singh GD, Kherani S
- 2320** Bone remodeling in sigmoid sinus diverticulum after stenting for transverse sinus stenosis in pulsatile tinnitus: A case report
Qiu XY, Zhao PF, Ding HY, Li XS, Lv H, Yang ZH, Gong SS, Jin L, Wang ZC
- 2326** Prolonged use of bedaquiline in two patients with pulmonary extensively drug-resistant tuberculosis: Two case reports
Gao JT, Xie L, Ma LP, Shu W, Zhang LJ, Ning YJ, Xie SH, Liu YH, Gao MQ
- 2334** Low-grade mucinous appendiceal neoplasm mimicking an ovarian lesion: A case report and review of literature
Borges AL, Reis-de-Carvalho C, Chorão M, Pereira H, Djokovic D
- 2344** Granulomatosis with polyangiitis presenting as high fever with diffuse alveolar hemorrhage and otitis media: A case report
Li XJ, Yang L, Yan XF, Zhan CT, Liu JH
- 2352** Primary intramedullary melanoma of lumbar spinal cord: A case report
Sun LD, Chu X, Xu L, Fan XZ, Qian Y, Zuo DM
- 2357** Proliferative glomerulonephritis with monoclonal immunoglobulin G deposits in a young woman: A case report
Xu ZG, Li WL, Wang X, Zhang SY, Zhang YW, Wei X, Li CD, Zeng P, Luan SD

- 2367** *Nocardia cyriacigeorgica* infection in a patient with pulmonary sequestration: A case report
Lin J, Wu XM, Peng MF
- 2373** Long-term control of melanoma brain metastases with co-occurring intracranial infection and involuntary drug reduction during COVID-19 pandemic: A case report
Wang Y, Lian B, Cui CL
- 2380** Solitary bone plasmacytoma of the upper cervical spine: A case report
Li RJ, Li XF, Jiang WM
- 2386** Two-stage transcrestal sinus floor elevation-insight into replantation: Six case reports
Lin ZZ, Xu DQ, Ye ZY, Wang GG, Ding X
- 2394** Programmed cell death protein-1 inhibitor combined with chimeric antigen receptor T cells in the treatment of relapsed refractory non-Hodgkin lymphoma: A case report
Niu ZY, Sun L, Wen SP, Song ZR, Xing L, Wang Y, Li JQ, Zhang XJ, Wang FX
- 2400** Pancreatic cancer secondary to intraductal papillary mucinous neoplasm with collision between gastric cancer and B-cell lymphoma: A case report
Ma YH, Yamaguchi T, Yasumura T, Kuno T, Kobayashi S, Yoshida T, Ishida T, Ishida Y, Takaoka S, Fan JL, Enomoto N
- 2409** Acquired haemophilia in patients with malignant disease: A case report
Krašek V, Kotnik A, Zavrtanik H, Klen J, Zver S

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Deb Sanjay Nag, Senior Consultant, Department of Anaesthesiology, Tata Main Hospital, C-Road (West), Bistupur, Jamshedpur 831 001, India. ds.nag@tatasteel.com

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2020 Edition of Journal Citation Reports® cites the 2019 impact factor (IF) for WJCC as 1.013; IF without journal self cites: 0.991; Ranking: 120 among 165 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2019 is 0.3 and Scopus CiteScore rank 2019: General Medicine is 394/529.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Yan-Xia Xing; **Production Department Director:** Yun-Xiaoqian Wu; **Editorial Office Director:** Jin-Li Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

April 6, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Two-stage transcrestal sinus floor elevation-insight into replantation: Six case reports

Zhe-Zhen Lin, Dong-Qian Xu, Zhang-Yan Ye, Ge-Ge Wang, Xi Ding

ORCID number: Zhe-Zhen Lin 0000-0002-3314-3265; Dong-Qian Xu 0000-0003-4123-0016; Zhang-Yan Ye 0000-0001-7842-3212; Ge-Ge Wang 0000-0002-7030-6510; Xi Ding 0000-0001-6782-3472.

Author contributions: Lin ZZ contributed to drafting the article, acquisition, analysis and interpretation of data; Xu DQ, Ye ZY and Wang GG revised the manuscript; Ding X revised it critically for important intellectual content, final approval of the version to be submitted, conception and design of the study; all authors issued final approval for the version to be submitted.

Supported by the Wenzhou Science and Technology Bureau Projects, No. Y20190105.

Informed consent statement: Informed written consent was obtained from the patients for publication of this report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE

Zhe-Zhen Lin, Dong-Qian Xu, Zhang-Yan Ye, Ge-Ge Wang, Xi Ding, Department of Stomatology, The First Affiliated Hospital of Wenzhou Medical University, Wenzhou 325000, Zhejiang Province, China

Corresponding author: Xi Ding, PhD, Professor, Department of Stomatology, The First Affiliated Hospital of Wenzhou Medical University, Nanbaixiang Ouhai District, Wenzhou 325000, Zhejiang Province, China. dingxi@wzhospital.cn

Abstract

BACKGROUND

Transcrestal sinus floor elevation (TSFE) has been widely used in the oral clinic when the residual bone height (RBH) exceeds 5 mm. However, when there is insufficient RBH in the posterior maxilla, two-stage TSFE may be an option.

CASE SUMMARY

This article introduces the concept of two-stage TSFE. Six patients had osseointegration failure after TSFE. For the first-stage surgery, we restricted the vertical bone augmentation as much as possible. At the second-stage surgery, the increased RBH was 3.28 ± 1.55 mm, which was beneficial for surgery. Five implants functioned successfully on schedule, but one implant failed again during the healing period. A third surgery was performed, and the implant functioned successfully.

CONCLUSION

When RBH was less than 5 mm, two or more procedures of TSFE might result in a higher RBH.

Key Words: Transcrestal sinus floor elevation; Dental implant; Two-stage; Replantation; Failure; Case report

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: When the residual bone height is less than 5 mm, two-stage transcrestal sinus floor elevation is a safe technology, which might be an excellent option to embed standard-length implants. Two-stage transcrestal sinus floor elevation could obtain more maxillary sinus membrane elevation height, especially in difficult and

Checklist (2016).

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Manuscript source: Unsolicited manuscript

Specialty type: Dentistry, oral surgery and medicine

Country/Territory of origin: China

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

Received: December 5, 2020

Peer-review started: December 5, 2020

First decision: January 7, 2021

Revised: January 21, 2021

Accepted: February 1, 2021

Article in press: February 1, 2021

Published online: April 6, 2021

P-Reviewer: Oley MH

S-Editor: Zhang H

L-Editor: Webster JR

P-Editor: Liu JH



complicated cases.

Citation: Lin ZZ, Xu DQ, Ye ZY, Wang GG, Ding X. Two-stage transcrestal sinus floor elevation-insight into replantation: Six case reports. *World J Clin Cases* 2021; 9(10): 2386-2393

URL: <https://www.wjgnet.com/2307-8960/full/v9/i10/2386.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v9.i10.2386>

INTRODUCTION

Two decades ago, we could not place implants in an atrophic posterior maxilla due to limited residual bone height (RBH). As a solution to this problem, transcrestal sinus floor elevation (TSFE) has been widely used in the oral clinic, and has been proven to be an effective method for atrophic posterior maxilla^[1]. Compared with lateral sinus floor elevation, TSFE is time-saving and economical, and patients experience less trauma after TSFE. Patients may suffer more complications after lateral sinus floor elevation^[2]. For doctors, it is easier to master TSFE with the application of new techniques. Nevertheless, if the RBH is less than 5 mm, short implants combined with TSFE is an option to solve this problem^[3]. Short implants may be prone to mechanical complications in the long term, and conventional implants are more common in oral clinics. Although TSFE combined with conventional implants could also be applied to a severely atrophic posterior maxilla^[4], a higher implant protrusion length might increase the risk of perforation. Therefore, we introduced the concept of two-stage TSFE, which has seldom been mentioned in previous studies^[5]. In our research, the implants combined with TSFE, showed adverse events, and another operation was required. The purpose of our study was to introduce the concept of two-stage TSFE.

CASE PRESENTATION

Chief complaints

Six patients (including four men and two women) ranging in age from 25 to 67 years consulted The First Affiliated Hospital of Wenzhou Medical University for prosthetic rehabilitation (Table 1).

History of present illness

These six patients lost teeth in the posterior maxilla and there was insufficient RBH in the posterior maxilla.

History of past illness

Two patients were smokers, and none had uncontrolled systemic diseases.

Laboratory examinations

Blood analysis of the six patients was performed before surgery, and all results were normal.

Imaging examinations

Radiographic and clinical examinations were performed before surgery. Figures 1-5 show that there was insufficient RBH in the posterior maxilla. Interestingly, the RBH in the second surgery was relatively higher than that in the first surgery.

FINAL DIAGNOSIS

Maxillary dentition defect (insufficient residual bone height in the posterior maxilla).

Table 1 Details of the six cases

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Gender	Woman	Man	Man	Man	Man	Woman
Age (yr)	25	54	29	63	46	67
Position	16	16	26	26	16	26
Smoking	No	Yes	No	Yes	No	No
Diabetes	No	No	No	No	No	No
First-stage surgery						
Bone substitute	Yes, bio-oss	Yes, bio-oss	No	Yes, bio-oss	No	Yes, bio-oss
Perforation	No	No	No	No	No	No
RBH (mm)	5.22	4.43	3.35	4.56	6.10	5.22
Implant (mm)	4.8 × 10; Straumann	4.8 × 8; Straumann	4.8 × 8; Straumann	4.8 × 10; Straumann	4.3 × 10; Nobel	4.8 × 10; Straumann
Stability (N cm)	≥ 25	25	15	≥ 25	15	25-35
Failure time	1 mo	2 mo	1 yr	1 mo	7 mo	1 mo
Second-stage surgery						
Bone substitute	No	No	No	No	No	Yes, bio-oss
Perforation	No	No	No	No	No	No
RBH (mm)	11.47	8.02	6.18	7.04	8.06	9.80
Implant (mm)	4.8 × 10; Straumann	4.8 × 10; Straumann	4.8 × 10; Straumann	4.8 × 10; Straumann	4.1 × 10; Straumann	4.8 × 12; Straumann
Stability (N cm)	15	15	15	≥ 25	≥ 25	15
Loading time	2.5 yr	2.5 yr	0	2.5 yr	2.5 yr	2.5 yr
Third-stage surgery						
Bone substitute			No			
Perforation			No			
RBH (mm)			6.49			
Implant (mm)			5.0 × 10; Nobel			
Stability (N cm)			25			

RBH: Residual bone height.

TREATMENT

Two-stage TSFE followed by simultaneous implant placement.

First surgery

This study followed the Declaration of Helsinki protocols. The RBH in all patients was insufficient, and therefore, TSFE was essential to place a regular implant (implant length = 10 mm). During the operation, TSFE and implants were performed simultaneously. In four cases, we chose 10 mm-long implants, and 8 mm-long implants were used in the other two cases. After the surgery, the patients were prescribed antibiotics and chlorhexidine. We told the patients not to inhale forcefully through the nose and not to swim for a week.

Unfortunately, these six implants were found to be mobile during the healing period or at the 1-year follow-up. Therefore, the failed teeth were extracted.

Second and third surgery

Another surgery was performed again immediately or after a sufficient healing period, and five of the six implants functioned on schedule (Figures 1-5). We placed five 10 mm-long implants and one 12 mm-long implant in the second-stage surgery. Nevertheless, one implant failed again, and a third surgery was performed. The 10

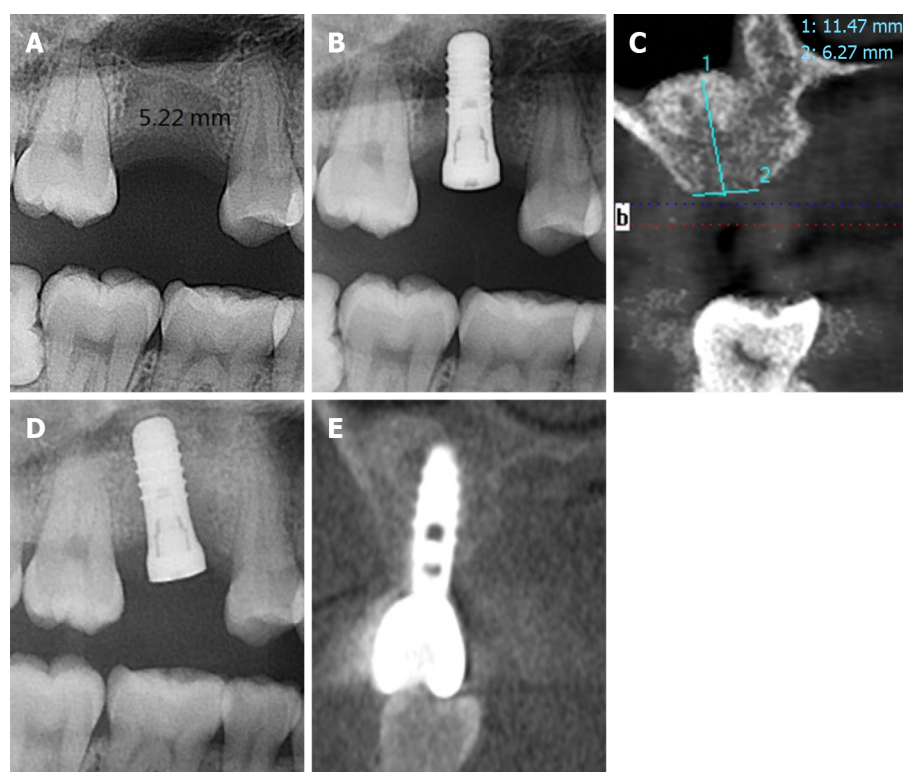


Figure 1 X-ray images of case 1. A: In the preoperative X-ray image of the first-stage surgery, the residual bone height was 5.22 mm; B: In the postoperative X-ray image of the first-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann); C: In the preoperative X-ray image of the second-stage surgery, the residual bone height was 11.47 mm; D: In the postoperative X-ray image of the second-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann); E: The X-ray image after prosthetic rehabilitation.

mm-long implant functioned on schedule after the third surgery.

OUTCOME AND FOLLOW-UP

Table 1 summarizes the main details of the six patients. No perforations occurred in the first-stage and second-stage surgery. In addition, bone material was utilized in four cases. The mean RBH before the first-stage surgery was 4.81 ± 0.93 mm, and the mean RBH before the second-stage surgery was 8.43 ± 1.92 mm. The mean RBH before the second-stage surgery was significantly higher than that before the first-stage surgery ($P < 0.05$). Functional restoration of five of the six implants was successful. One implant required a third surgery and functioned successfully. Three implants have been loaded for 2.5 years, and the other two implants had been loaded for 1.5 years. These patients were satisfied with implant restoration.

DISCUSSION

In this study, implants combined with TSFE in the first-stage surgery showed osseointegration failure and the patients were willing to undergo further surgery. The RBH before the second-stage surgery was relatively higher than that before the first operation, which was beneficial for surgery. Five of the implants were successfully loaded. We learned from this procedure that doctors should not consider osseointegration failure of TSFE as negative. Instead, doctors must communicate with patients. If patients would like to undergo further surgery, doctors should be confident about surgery, due to the possibility of a higher RBH.

Knowledge was obtained from the six failed cases of osseointegration, which indicated that two or three TSFE procedures could increase the RBH. We called this procedure “two-stage TSFE or progressive TSFE”, which has rarely been mentioned in previous studies. Therefore, the concept of two-stage TSFE was introduced. Trombelli *et al*^[6] (2015) introduced the concept of “incremental TSFE”, they performed TSFE with

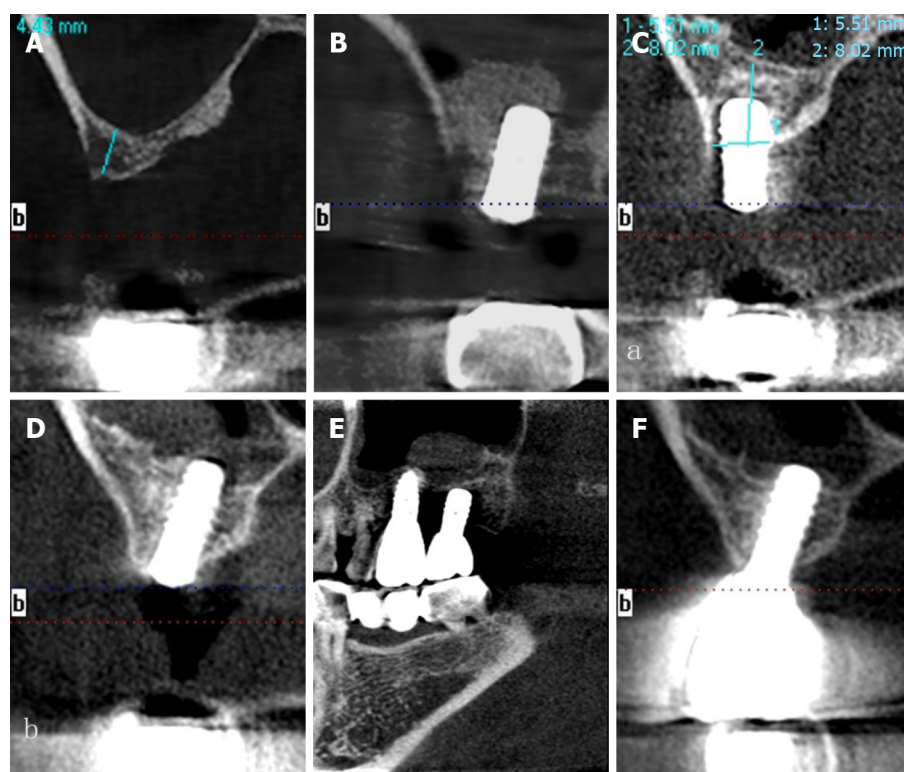


Figure 2 X-ray images of case 2. A: In the preoperative X-ray image of the first-stage surgery, the residual bone height was 4.43 mm; B: In the postoperative X-ray image of the first-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann); C: In the preoperative X-ray image of the second-stage surgery, the residual bone height was 8.02 mm; D: In the postoperative X-ray image of the second-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann); E: The X-ray image after prosthetic rehabilitation; F: The x-ray image after prosthetic rehabilitation.

graft material in the first stage surgery. Several months later, TSFE was repeated at the molar sites, and conventional implants were simultaneously placed in the sites. This protocol was safe and minimally invasive, decreasing the risk of membrane laceration. Although vertical augmentation greater than 6 mm could also lead to excellent clinical performance with the development of technology^[7], the implant protrusion length should be restricted owing to the lower incidence of complications.

The principle of our study was similar to that of the above study^[6]. It was accidentally found that the RBH at the sites had increased after osseointegration failure. In the first-stage surgery, we chose a conservative approach as much as possible, and the membrane had the capability of osteogenesis. As a result, the RBH before the second-stage surgery was higher than that before the first-stage surgery.

We should restrict the implant protrusion length in the TSFE (≤ 5 mm), which is a disadvantage of this procedure. The implant protrusion length can exceed 5 mm in the lateral sinus floor elevation, which is considered an advantage of this procedure. However, TSFE is time-saving and less traumatic. Therefore, TSFE has been widely used in oral clinics.

It is known that TSFE has a certain failure rate^[8]. Patients may feel disappointed if they encounter osseointegration failure, and they may be afraid of undergoing further surgery. However, osseointegration failure does not mean that the sites cannot be implanted. Above all, we need to respect the opinion of the patients. After a detailed clinical and radiographic assessment, we performed TSFE again and embedded another longer implant, and the clinical performance of the replantation was satisfactory.

Consequently, we concluded that a two-stage TSFE protocol can be selected to embed a standard-length implant if the RBH is less than 5 mm, as the two-stage TSFE could obtain more maxillary sinus membrane elevation height. In the first-stage surgery, the graft materials can be placed after TSFE, which contributed to the second-stage surgery. The latter avoids the relatively complicated operation of lateral window sinus elevation surgery. When the residual bone height is less than 5 mm, two-stage TSFE might be a safe and good choice, and is suitable for general dentistry. The lateral window sinus elevation would cause unnecessary damage to patients and more complications. Nevertheless, the sample size in this study was limited; therefore, studies with a larger sample size are required in the future.

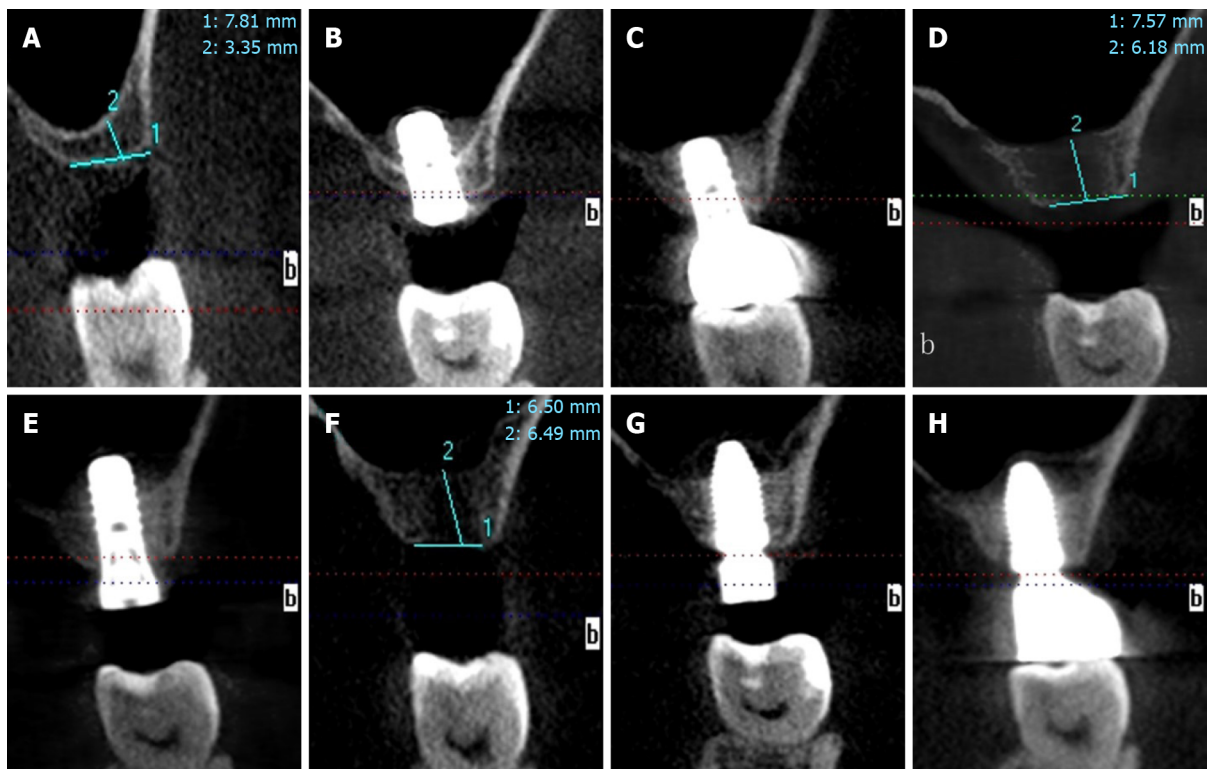


Figure 3 X-ray images of case 3. A: In the preoperative X-ray image of the first-stage surgery, the residual bone height was 3.35 mm; B: In the postoperative X-ray image of the first-stage surgery, we placed a 4.8 mm-wide and 8 mm-long implant (Straumann); C: The X-ray image after prosthetic rehabilitation; D: In the preoperative X-ray image of the second-stage surgery, the residual bone height was 6.18 mm; E: In the postoperative X-ray image of the second-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann), the implant was found to be mobile after 4 months; F: In the preoperative X-ray image of the third-stage surgery, the residual bone height was 6.49 mm; G: In the postoperative X-ray image of the third-stage surgery, we placed a 5.0 mm-wide and 10 mm-long implant (Nobel); H: The X-ray image after prosthetic rehabilitation.

CONCLUSION

In summary, two-stage transcrestal sinus floor elevation might be an excellent option to embed standard-length implants when the residual bone height is less than 5 mm. In addition, there were limited cases and follow-up time in this study, failure of TSFE should be treated positively, and osseointegration failure could provide a better bone volume, which was beneficial in our implantation.

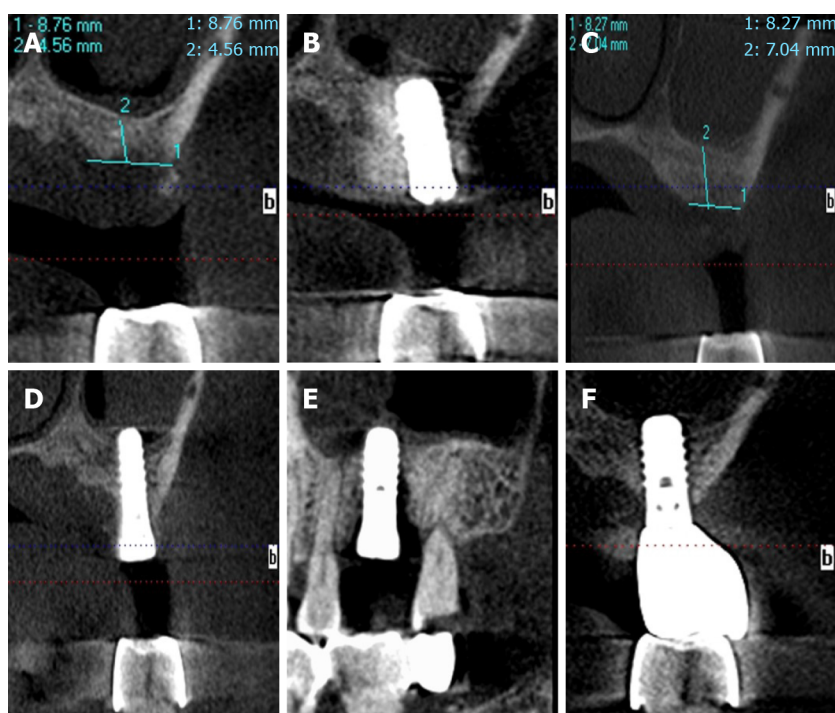


Figure 4 X-ray images of case 4. A: In the preoperative X-ray image of the first-stage surgery, the residual bone height was 4.56 mm; B: In the postoperative X-ray image of the first-stage surgery, we placed a 4.8 mm-wide and 10 mm-long implant (Straumann); C: In the preoperative X-ray image of the second-stage surgery, the residual bone height was 7.04 mm; D: In the postoperative X-ray image of the second-stage surgery, we placed 4.8 mm-wide and 10 mm-long implant (Straumann); E: The X-ray image after prosthetic rehabilitation; F: The x-ray image after prosthetic rehabilitation.

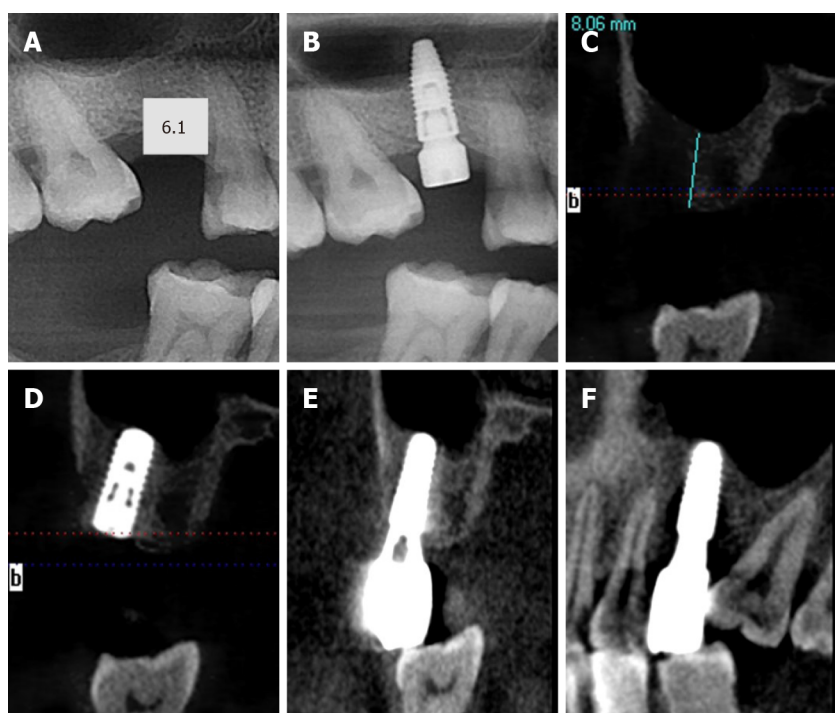


Figure 5 X-ray images of case 5. A: In the preoperative X-ray image of the first-stage surgery, the residual bone height was 6.10 mm; B: In the postoperative X-ray image of the first-stage surgery, we placed a 4.3 mm-wide and 10 mm-long implant (Nobel); C: In the preoperative X-ray image of the second-stage surgery, the residual bone height was 8.06 mm; D: In the postoperative X-ray image of the second-stage surgery, we placed a 4.1 mm-wide and 10 mm-long implant (Straumann); E: The X-ray image after prosthetic rehabilitation; F: The X-ray image after prosthetic rehabilitation.

REFERENCES

- 1 El Hage M, Nurdin N, Abi Najm S, Bischof M, Nedir R. Osteotome Sinus Floor Elevation Without Grafting: A 10-Year Study of Cone Beam Computerized Tomography vs Periapical Radiography. *Int J*

- Periodontics Restorative Dent* 2019; **39**: e89-e97 [PMID: 30986289 DOI: 10.11607/prd.3777]
- 2 **Stacchi C**, Andolsek F, Berton F, Perinetti G, Navarra CO, Di Lenarda R. Intraoperative Complications During Sinus Floor Elevation with Lateral Approach: A Systematic Review. *Int J Oral Maxillofac Implants* 2017; **32**: e107-e118 [PMID: 28494033 DOI: 10.11607/jomi.4884]
 - 3 **Pjetursson BE**, Rast C, Brägger U, Schmidlin K, Zwahlen M, Lang NP. Maxillary sinus floor elevation using the (transalveolar) osteotome technique with or without grafting material. Part I: Implant survival and patients' perception. *Clin Oral Implants Res* 2009; **20**: 667-676 [PMID: 19486079 DOI: 10.1111/j.1600-0501.2009.01704.x]
 - 4 **Chausu L**, Chausu G, Better H, Naishlos S, Kolerman R, Aragonese JM, Calvo-Guirado JL, Nissan J. Sinus Augmentation with Simultaneous, Non-Submerged, Implant Placement Using a Minimally Invasive Hydraulic Technique. *Medicina (Kaunas)* 2020; **56** [PMID: 32069970 DOI: 10.3390/medicina56020075]
 - 5 **Franceschetti G**, Farina R, Stacchi C, Di Lenarda R, Di Raimondo R, Trombelli L. Radiographic outcomes of transcrestal sinus floor elevation performed with a minimally invasive technique in smoker and non-smoker patients. *Clin Oral Implants Res* 2014; **25**: 493-499 [PMID: 23656234 DOI: 10.1111/clr.12188]
 - 6 **Trombelli L**, Franceschetti G, Trisi P, Farina R. Incremental, transcrestal sinus floor elevation with a minimally invasive technique in the rehabilitation of severe maxillary atrophy. Clinical and histological findings from a proof-of-concept case series. *J Oral Maxillofac Surg* 2015; **73**: 861-888 [PMID: 25795180 DOI: 10.1016/j.joms.2014.12.009]
 - 7 **Better H**, Chausu L, Nissan J, Xavier S, Tallarico M, Chausu G. The Feasibility of Flapless Approach to Sinus Augmentation Using an Implant Device Designed According to Residual Alveolar Ridge Height. *Int J Periodontics Restorative Dent* 2018; **38**: 601-606 [PMID: 29253040 DOI: 10.11607/prd.2950]
 - 8 **Călin C**, Petre A, Drafta S. Osteotome-mediated sinus floor elevation: a systematic review and meta-analysis. *Int J Oral Maxillofac Implants* 2014; **29**: 558-576 [PMID: 24818194 DOI: 10.11607/jomi.3206]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

