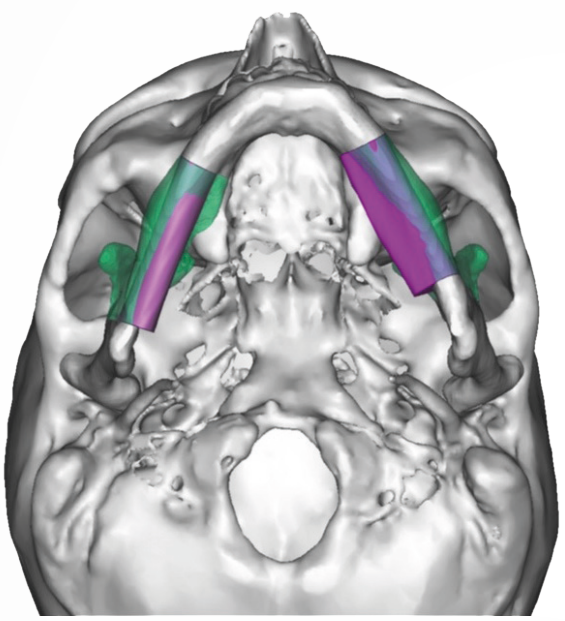
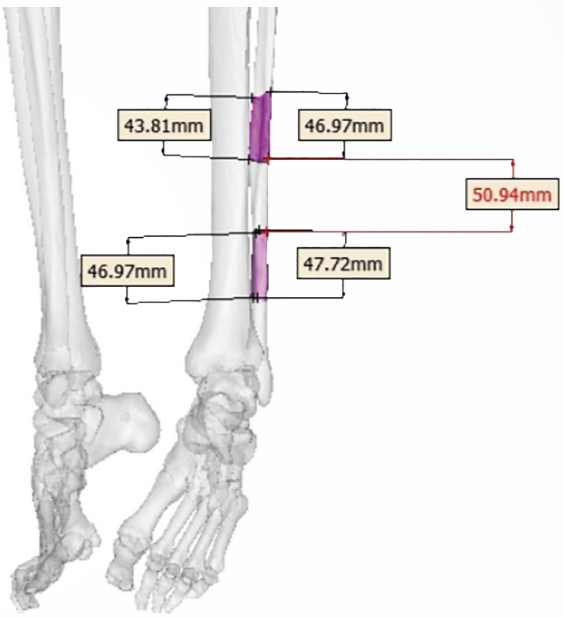
VOLUME 3 • ISSUE 3 • 2019

ISSN 2519-2086

Journal of DIAGNOSTICS & TREATMENT of Oral & Maxillofacial Pathology

3 2019





Section Editor
Head & Neck Oncological Surgery
Todd Hanna (New York, NY, USA)

omf publishing

Official Journal of the
Ukrainian Association for
Maxillofacial and Oral Surgeons

dtjournal.org

U-Impl®
SWITZERLAND

№ R3M 804 252 B2

Сертифікат відповідності
технічного регламенту
щодо медичних виробів

Switzerland Aarbergerstrasse 107A, CH-2502
Biel, Phone/Fax +41 323230188
info@u-impl.com
www.u-impl.com

Goals & Scope

Journal of Diagnostics & Treatment of Oral & Maxillofacial Pathology goals to publish the cutting-edge and peer-reviewed articles on work in oral and maxillofacial surgery and neighboring specialties. The journal includes the following topics: implants surgery, head and neck imaging, microvascular and reconstructive surgery, oral and maxillofacial pathology, head and neck surgery/oncology, TMJ lesions/disorders, head and neck trauma, plastic surgery, pharmacology/drugs.

The *Journal* is registered in Ministry of Justice of Ukraine
Registration Certificate: KB №22251-12151P
Issued on July 28, 2016
ISSN 2522-1965 (Online)
ISSN 2519-2086 (Print)

3 (3) 2019
Frequency: 12 times a year

SUBSCRIPTION INDEX IN UKRAINE: 60077. Details at page A7

The *Journal* is included to the list of scientific professional publications (issued on December 28, 2017; protocol #1714) of Ministry of Education and Science of Ukraine. In that *Journal* the results of dissertation papers can be published for obtaining the degrees of Candidate and Doctor of Medical Sciences.

Citations
CrossRef, Google Scholar

Co-founders
Shupyk National Medical Academy of Postgraduate Education
Private Higher Educational Establishment
"Kyiv Medical University"
OMF Publishing, LLC

Investments
Ellet E. (Ukraine)

Marketing and Advertising
Dushyna A.I. (Canada)

Ukrainian Association for Maxillofacial and Oral Surgeons (UAMOS)
4-A Profesora Pidvysotskogo Street, Kyiv 01103, Ukraine.
Tel., fax: +38 (044) 528 35 17.
E-mail: *info.uamos@gmail.com*
UAMOS webpage: *www.uamos.org*

Is Recommended by
Ukrainian Association for Maxillofacial and Oral Surgeons.

Published by
OMF Publishing, LLC
13-A Simferopolska Street, office 121, Kyiv, Ukraine, 02096
Tel: +38 (063) 293 18 13,
Instagram: *omf_publishing*
Printed in Ukraine

Editorial Board

MARCH 2019 · VOLUME 3 · ISSUE 3
www.dtjournal.org

FIGURE. Professor Oleksii O. Tymofieiev (*left*) and Professor Rui P. Fernandes (*right*) at 1st International Scientific Congress of the Azerbaijan Society of Oral and Maxillofacial Surgeons. 14 March, 2019; Baku, Azerbaijan.

Editorial Board

MARCH 2019 · VOLUME 3 · ISSUE 3
www.dtjournal.org

Continued from page EB A2

Editorial Board

MARCH 2019 · VOLUME 3 · ISSUE 3
www.dtjournal.org

Editorial Board

Continued from page EB A3

TANTUM VERDE®

INFORMATION LEAFLET
for the medicinal product

Composition:
active substance: **benzydamine hydrochloride**;
100 mL of solution contain benzydamine hydrochloride 0.15 g;
excipients: ethanol 96%, glycerol, methyl parahydroxybenzoate (E 218), flavor (menthol), saccharin, sodium hydrocarbonate, Polysorbate 20, Quinoline Yellow (E 104), Patent Blue V (E 131), purified water.

Dosage form. Oromucosal solution.
Basic physical and chemical properties: a clear green liquid with a typical mint flavor.

Pharmacotherapeutic group. Dental preparations. Other agents for local oral treatment.
ATC code: A01A D02.

Pharmacological properties.
Pharmacodynamics.
Benzydamine is a non-steroidal anti-inflammatory drug (NSAID) with analgesic and antiexudative properties.

Clinical studies have shown that benzydamine is effective in the relief of symptoms accompanying localized irritation conditions of the oral cavity and pharynx. Moreover, benzydamine has anti-inflammatory and local analgesic properties, and also exerts a local anesthetic effect on the oral mucosa.

Pharmacokinetics.
Absorption through the oral and pharyngeal mucosa has been proven by the presence of measurable quantities of benzydamine in human plasma. However, they are insufficient to produce any systemic pharmacological effect. The excretion occurs mainly in urine, mostly as inactive metabolites or conjugated compounds.

When applied locally, benzydamine has been shown to cumulate in inflamed tissues in an effective concentration due to its ability to permeate through the mucous membrane.

Clinical particulars.
Indications.
Symptomatic treatment of oropharyngeal irritation and inflammation; to relieve pain caused by gingivitis, stomatitis, pharyngitis; in dentistry after tooth extraction or as a preventive measure.
Contraindications.
Hypersensitivity to the active substance or to any other ingredients of the product.

Interaction with other medicinal products and other types of interaction.
No drug interaction studies have been performed.

Warnings and precautions.
If sensitivity develops with long-term use, the treatment should be discontinued and a doctor should be consulted to get appropriate treatment.

In some patients, buccal/pharyngeal ulceration may be caused by severe pathological processes. Therefore, the patients, whose symptoms worsen or do not improve within 3 days or who appear feverish or develop other symptoms, should seek advice of a physician or a dentist, as appropriate.

Benzydamine is not recommended for use in patients hypersensitive to acetylsalicylic acid or other non-steroidal anti-inflammatory drugs (NSAIDs).

The product can trigger bronchospasm in patients suffering from or with a history of asthma. Such patients should be warned of this.

For athletes: the use of medicinal products containing ethyl alcohol might result in positive antidoping tests

considering the limits established by some sports federations.

Use during pregnancy or breast-feeding
No adequate data are currently available on the use of benzydamine in pregnant and breastfeeding women. Excretion of the product into breast milk has not been studied. The findings of animal studies are insufficient to make any conclusions about the effects of this product during pregnancy and lactation.

The potential risk for humans is unknown.

TANTUM VERDE should not be used during pregnancy or breast-feeding.

Effects on reaction time when driving or using machines
When used in recommended doses, the product does not produce any effect on the ability to drive and operate machinery.

Method of administration and doses.
Pour 15 mL of TANTUM VERDE solution from the bottle into the measuring cup and gargle with undiluted or diluted product (15 mL of the measured solution can be diluted with 15 mL of water). Gargle 2 or 3 times daily. Do not exceed the recommended dose.

Children.
The product should not be used in children under 12 years due to a possibility of ingestion of the solution when gargling.

Overdosage.
No overdose has been reported with benzydamine when used locally. However, it is known that benzydamine, when ingested in high doses (hundreds times higher than those possible with this dosage form), especially in children, can cause agitation, convulsions, tremor, nausea, increased sweating, ataxia, and vomiting. Such acute overdose requires immediate gastric lavage, treatment of fluid/salt imbalance, symptomatic treatment, and adequate hydration.

Adverse reactions.
Within each frequency group, the undesirable effects are presented in order of their decreasing seriousness.

Adverse reactions are classified according to their frequency: very common (≥ 1/10); common (≥ 1/100 to <1/10); uncommon (≥ 1/1,000 to <1/100); rare (≥ 1/10,000 to <1/1,000); very rare (<1/10,000); frequency unknown (cannot be estimated from the available data).

Gastrointestinal disorders: rare – burning mouth, dry mouth; *unknown* – oral hypesthesia, nausea, vomiting, tongue edema and discoloration, dysgeusia.

Immune system disorders: rare – hypersensitivity reaction, *unknown* - anaphylactic reaction.

Respiratory, thoracic and mediastinal disorders: very rare –laryngospasm; *unknown* – bronchospasm.

Skin and subcutaneous tissue disorders: uncommon – photosensitivity; *very rare* – angioedema; *unknown* – rash, pruritus, urticaria.

Nervous system disorders: unknown – dizziness, headache.

TANTUM VERDE contains methyl parahydroxybenzoate, which can cause allergic reactions (including delayed-type reactions).

Shelf life. 4 years.

Storage conditions.
Do not store above 25°C. Keep out of reach of children.

Packaging.
120 mL of solution in a bottle with a measuring cup; 1 bottle per cardboard box.

Dispensing category.
Over-the-counter medicinal product.

Manufacturer.
Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Italy.

Location of the manufacturer and its business address.
Via Vecchia del Pinocchio, 22 – 60100 Ancona (AN), Italy.

Date of the last revision of the text.
September 26, 2018.

Information leaflet is
APPROVED by
Order of the
Ministry of Health of Ukraine
No. 636 dated 01.10.2015
Registration Certificate
No. UA/3920/01/01

Subscription in Ukraine

A *Journal of Diagnostics & Treatment of Oral & Maxillofacial Pathology* is published monthly. A subscription for individuals and institutions to the print version of the *Journal* is performed both in any state post offices of Ukrposhta at the territory of Ukraine and online via website www.presa.ua

SUBSCRIPTION INDEX IS: 60077

From a January 2019 the *Journal* becomes a monthly publication. Taking into account that individuals or institutions who have already subscribed 4 Issues (in 2019) or will subscribe the *Journal* in 2019 will receive additional 8 Issues free of charge.

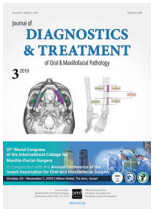
From the end of 2019 it will be possible to subscribe all 12 of 2020-year Issues.

ANOUNCMENT: At the end of the 2019 it will be possible subscribe the *Journal* from any corner of the globe via *Journal*`s website.

Number of Issues (Numbers)	Cost
4 issues in 2019 (March, June, September, December)	US $ 27.68 (UAH 782.00)
12 issues in 2020	US $ 83.95 (UAH 2 325.12)

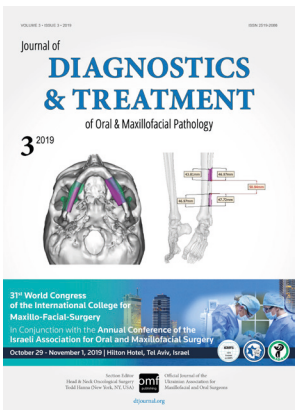
Content

of the Volume 3 (Issue 3) 2019



ERRATUM

In “Muenke Syndrome: Variable Expressivity between Family Members” (Acosta–Guio et al, *J Diagn Treat Oral Maxillofac Pathol* 3(2):38–51, 2019) the correct spelling of the third author`s name is Jaime Andrés Jiménez.



Journal`s cover images
(virtual surgical planning for a bilateral segmental mandibular reconstruction with single fibula segmented transplants) are courtesy of:

Todd Hanna, MD, DDS, FACS *(lecturing on the upper image)*

Private Surgical Practice; Todd Hanna, MD, DDS, PC
Attending; Department of Head & Neck Surgery,
NY Head & Neck Institute at Lenox Hill Hospital, Northwell Health System

Address: *16 East 52nd Street, Suite 1101 New York, NY 10022, USA*
Website: *www.toddhannamddds.com*
E-mail: *info@toddhannamddds.com*
Instagram: *doctor.hanna*

WELCOME LETTER

Dear Colleagues,

Tradition and progress coming together.

Maxillofacial surgery is one of the most diverse and challenging professions. We operate while influencing on a person's facial appearance, some of the times unintentionally while at other times in order to improve appearance. We treat bony tissue and soft tissue, functional structures and aesthetic structures, healthy people and sick ones, children and adults. Our field includes numerous procedures; from minor oral surgery and implantology up to major head & neck surgery and reconstruction.

Due to the diversity of our field, an increased number of technological developments are introduced constantly, starting from minimal invasive endoscopic instrumentation up to virtual 3D pre planning of operations and personalized surgical guides and implants.

Research is an important part of our field and completes the clinical activity.

All of the above require us to exchange experiences and developments in our field in order to allow the best possible care for our patients.

In light of the importance of these scientific meetings it is my pleasure to invite you to the 31st World Congress of the International College for Maxillo-Facial-Surgery (ICMFS), which will be held in Tel Aviv, Israel between the 29th of October and the 1st of November 2019 (www.icmfs2019.com).

This congress will include keynote lectures from some of the most experienced and well known surgeons of our field.

In addition, we want this congress to act as a platform for all of you to exhibit your experience as well as your research accomplishments while conducting discussions to improve you as a clinician and researcher.

In this congress you will be exposed to keynote lectures, oral presentations, poster presentations, masterclasses, panel discussions, evening receptions and more. You will get the chance to meet new people in your field and form collaborations.

You will have the opportunity to see Israel with all of its historical past and numerous beaches and cultural experience as well as great food and great weather.

We are looking forward to meet you all in the congress and have a wonderful time together in Israel.

Adi Rachmiel, Professor
President, 31st ICMFS World Congress 2019

Dr. Yoav Leiser
President Elect, Israeli Association for Oral and Maxillofacial Surgery

Editorial

DT Journal in Instagram: Reaching 1000+ Followers

Oleksii O. Tymofieiev

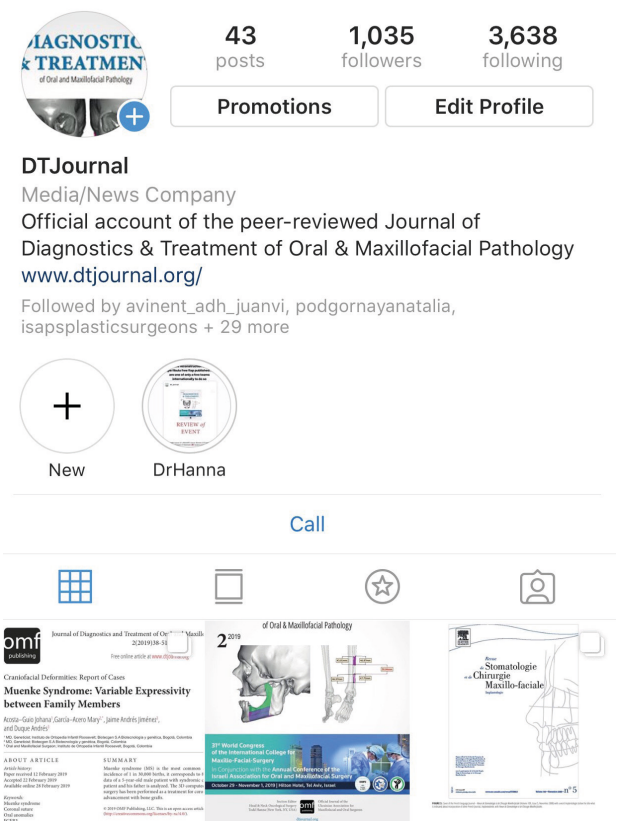


FIGURE. Official Instagram account of the Journal was launched in March, 2017.

I never thought that social media would have changed my life at all.[1]
—Rod J. Rohrich, 2017 (USA)

Instagram account of the *Journal of Diagnostics and Treatment of Oral and Maxillofacial Pathology (DT Journal)* (Fig) was launched in March 19, 2017 when the 1st Issue of completely new publication was presented at 23rd International Conference on Oral and Maxillofacial Surgeons (ICOMS) in Hong Kong. And in 2 years the page reached 1000+ followers with 43 posts.

In June 2018 an Instagram had reached 1 billion monthly active users.[2] This fact indicates a significant growth of the network from 2016 when it surpassed 600 millions monthly active users of Twitter.[3] This overwhelming network growth teaches us how huge the potential of the Instagram is and how far we can go in developing the *DT Journal*`s official account. It can definitely elevate *1)* the journal`s popularity, *2)* an attractivity for authors, and *3)* a sharing rate of the open access articles to a much wider audience.

REFERENCES

1. Rohrich RJ. So, do you want to be facebook friends? How social media have changed plastic surgery and medicine forever. *Plast Reconstr Surg* **2017**;139(4):1021–6. https://dx.doi.org/10.1097/PRS.0000000000003188.
2. Number of monthly active Instagram users from January 2013 to June 2018 (in millions) [document on the internet]; **2019** March 30 [cited 2019 Mar 30]. Available from: https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/.
3. Langenfeld SJ, Batra R. How can social media get us in trouble? *Clin Colon Rectal Surg* **2017**;30(4):264–9. https://dx.doi.org/10.1055/s-0037-1604255.

ScD, Professor. Head, Maxillofacial Surgery Department, Shupyk National Medical Academy of Postgraduate Education, Kyiv, Ukraine.

E-mail: tymofeev@gmail.com (Oleksii O. Tymofieiev)
Journal`s Instagram: dt_journal

http://dx.doi.org/10.23999/j.dtomp.2019.3.1.

Microvascular Surgery: Case Report + Video

State of the Art Simultaneous Bilateral Segmental Mandibular Reconstruction using a Single Fibula Transplant: Discussion of the Surgical Steps

Todd C. Hanna[a,*] and Dennis H. Kraus[b]

SUMMARY

During last 22 years the different reports have shown successful using of vascularized single fibular transplant for a simultaneous bilateral segmental mandibular reconstruction.[5-9] The surgeries were performed in cases of bilateral mandibular defects of different origin: *1)* bilateral infected pseudoarthrosis,[5] *2)* bilateral squamous cell carcinoma of the mandible,[6] *3)* bilateral ossifying fibroma,[7] *4)* osteoradionecrosis that caused mandibular defects,[8, 9] and *5)* traumatic mandibular defects.[10] We present a case of a 60-year-old patient who was referred to our clinic with osteoradionecrosis of bilateral mandible, which was reconstructed using a single fibula flap. A 6-month follow-up images are presented.

This is the first report of a bilateral mandibular angle functional reconstruction with a single fibula free vascularized flap. Its particular vascularization allows not only osteotomies but also ostectomy of a middle shaft.[5]

—Hervé Reychler et al, 1997
Belgium

Using of the free fibula flaps in mandibular reconstruction was popularized by Hidalgo in 1989.[1-4] Reychler et al[5] in 1997 reported a first result of a bilateral mandibular angle functional reconstruction with a single fibula free vascularized flap. For almost twenty-two years, from 1997 to 2019, the different authors reconstructed bilateral defects on the mandible according to next etiologies:

1. Reychler et al, 1997 – for a bilateral infected pseudoarthrosis.[5]
2. Bianchi et al, 2008 – because of a rare bilateral squamous cell carcinoma of the mandible.[6]
3. Mello-Filho et al, 2008 – according to bilateral ossifying fibroma.[7]
4. Jacobson et al, 2010[8] and Chen et al, 2018[9] – because of an osteoradionecrosis that caused mandibular defects.
5. Ekanayake et al, 2013 – for a traumatic origin (shrapnel injury: a patient had 2 segmental defects with intact mandibular rami with condyles and intact mandibular symphyses).[10]

[a] MD, DDS, FACS; Private Surgical Practice; Todd Hanna, MD, DDS, PC Attending; Department of Head & Neck Surgery, NY Head & Neck Institute at Lenox Hill Hospital, Northwell Health System. New York, NY, USA.

[b] MD, FACS; Director, Center for Head & Neck Oncology, New York Head & Neck Institute & the North Shore-LIJ Cancer Institute. Center for Thyroid & Parathyroid Surgery. New York, NY, USA.

** Corresponding author address: 16 East 52nd Street, Suite 1101 New York, NY 10022, USA*
Website: www.toddhannamddds.com
E-mail: info@toddhannamddds.com (Todd Hanna)
Instagram: doctor.hanna
Co-author`s e-mail: dkraus@northwell.edu (Dennis Kraus)

Paper received 15 March 2019
Accepted 27 March 2019
Available online 31 March 2019
http://dx.doi.org/10.23999/j.dtomp.2019.3.2.

The goal of that report is to highlight and discuss the consecutive stages of using vascularized single fibular transplant for a simultaneous bilateral segmental mandibular reconstruction (BSMR) in a 60-year-old patient who presented with osteoradionecrosis of the bilateral mandible due to radiation injury.

CASE AND DISCUSSION

A 60-year-old white male patient referred to our Clinic with a diagnosis–osteoradionecrosis of the bilateral mandible due to radiation injury (which was done for nonsurgical cancer treatment). A perfect staging classification of osteoradionecrosis[11, 12] is described by Chronopoulus et al (2018).[13] In our case two isolated bilateral mandibular defects (according to Schrag et al systematization – Table 1) were expected.[14]

A bilateral mandibular segmental reconstruction (Fig 1) with a single fibular transplant for our patient was indicated. It's that we did so while preserving the chin. Traditionally the chin would be removed along with the other segments and muscular attachments of the tongue and lower lip, and remaining teeth, would be lost. This would severely affect speech, swallowing and esthetics. By preserving the chin we greatly preserve form function and quality of life with near base-line esthetics.

ARGUMENTS FOR VASCULARIZED BONE GRAFTS

Bae and Waters the perfectly structured arguments for different types of grafts (Table 2) made understanding of its` benefits as easy as possible.[15]

FIBULA FLAP ADVANTAGES & DISADVANTAGES

Shetawi and Buchbinder based on the literature and their own experience data made a clear classification of the fibula flap advantages (Table 3) and disadvantages (Table 4) in the textbook *Contemporary Oral Oncology: Oral and Maxillofacial Reconstructive Surgery* under editorship of Moni Kuriakose.[16]

TABLE 1. Mandibular Defects Classification Related with Components of the Defect (Schrag et al).[14]

Defect`s Type	Defect`s Components
Isolated	Bone only
Compound	Bone + intraoral mucosa/facial skin
Composite	Bone + intraoral mucosa + facial skin
Extensive composite	Bone + intraoral mucosa + facial skin + adjacent intraoral structure (tongue, maxilla, pharynx). Cheek volume deficit is noted

TABLE 2. Bae and Waters Systematization of the Bone Grafts Properties.[15]

Graft`s Type	Osteoconduction	Osteoinduction	Osteogenesis	Mechanical Strength	Vascularity
Bone marrow	+/–	+	++	–	–
Cancellous autograft	++	+	++	+	–
Cortical autograft	+	+/–	+	++	–
Vascularized	++	+	++	++	++

TABLE 3. Shetawi and Buchbinder `s Proved Fibula Flap Advantages.[16]

Fibula Flap Advantages
Long bone
Thick cortex
Long vascular pedicle with good caliper
Dual blood supply to the bone
Possibility of 2-team approach
Possibility of harvesting with fascia, muscle, and/or skin

TABLE 4. Shetawi and Buchbinder `s Proved Fibula Flap Disadvantages.[16]

Fibula Flap Disadvantages
Insufficient bone segment high
Long scar at the lower extremity
Need to graft long soft tissue defect
Weakness in toe dorsiflexion
Ankle discomfort and gait disturbance

VIRTUAL SURGICAL PLANNING

We uploaded the patient`s multislice computed tomography (CT) scans and lower limb CT angiograms to 3D Systems (Rock Hill, South Carolina, USA). The patient was planned for a bilateral mandibular osteotomy (Fig 1) – Jewer Class L bilateral defect.[4, 17]

Virtual surgical planning calculated a need for total 145.63-mm left fibula bone segment (divided into 3 segments), using enough pedicle for anastomosis in the left mandibular defect. The length of fibular segments (Fig 2) was: *1)* 46.97 to 47.72 mm – the lower fibula bone segment; *2)* 50.94 mm – the middle segment, *3)* and 43.81 to 46.97 mm – the upper fibula bone segment.

PREOPERATIVE TRACHEOTOMY: PRO AND CONTRA

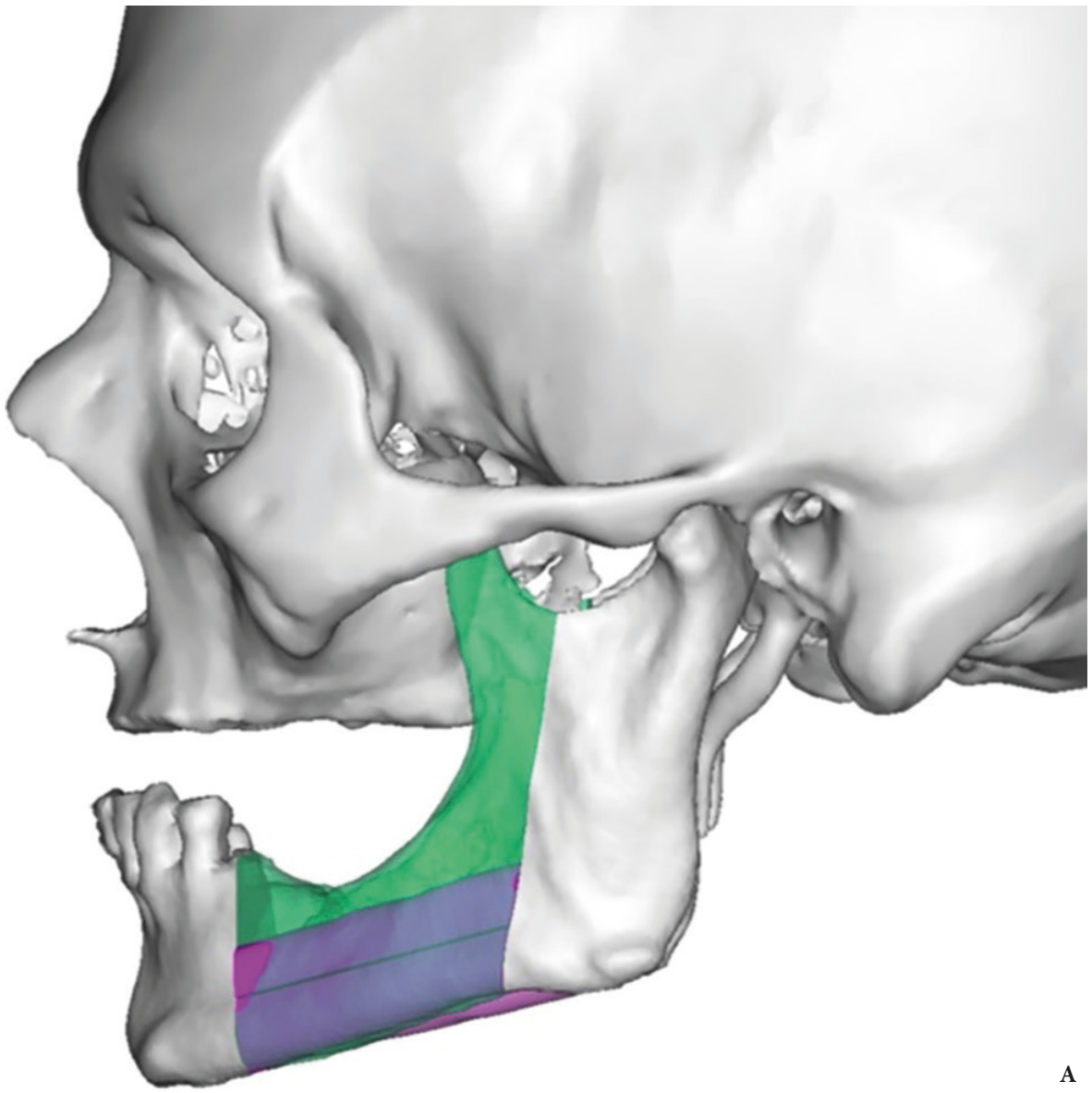
Lapis et al (2015) in the study "Factors in successful elimination of elective tracheotomy in mandibular reconstruction with microvascular tissue" (Table 5) reported that mandibular resection and reconstruction can be performed safely without elective tracheotomy but only in a selected group of patients.[18]

Statopoulus and Stassen emphasize that secure airway is critically important in the intraoperative and early postoperative period for patients undergoing head and neck cancer surgery.[28] A volume of the surgery upon bilateral mandibular reconstruction is similar with head–neck cancer surgery. So, it's extremely important to secure the airway before initiated the reconstruction`s surgical steps.

Shetawi and Buchbinder are recommending having temporary tracheostomy during 5-7 days of postoperative period with a purpose to avoid airway compromise.[16]

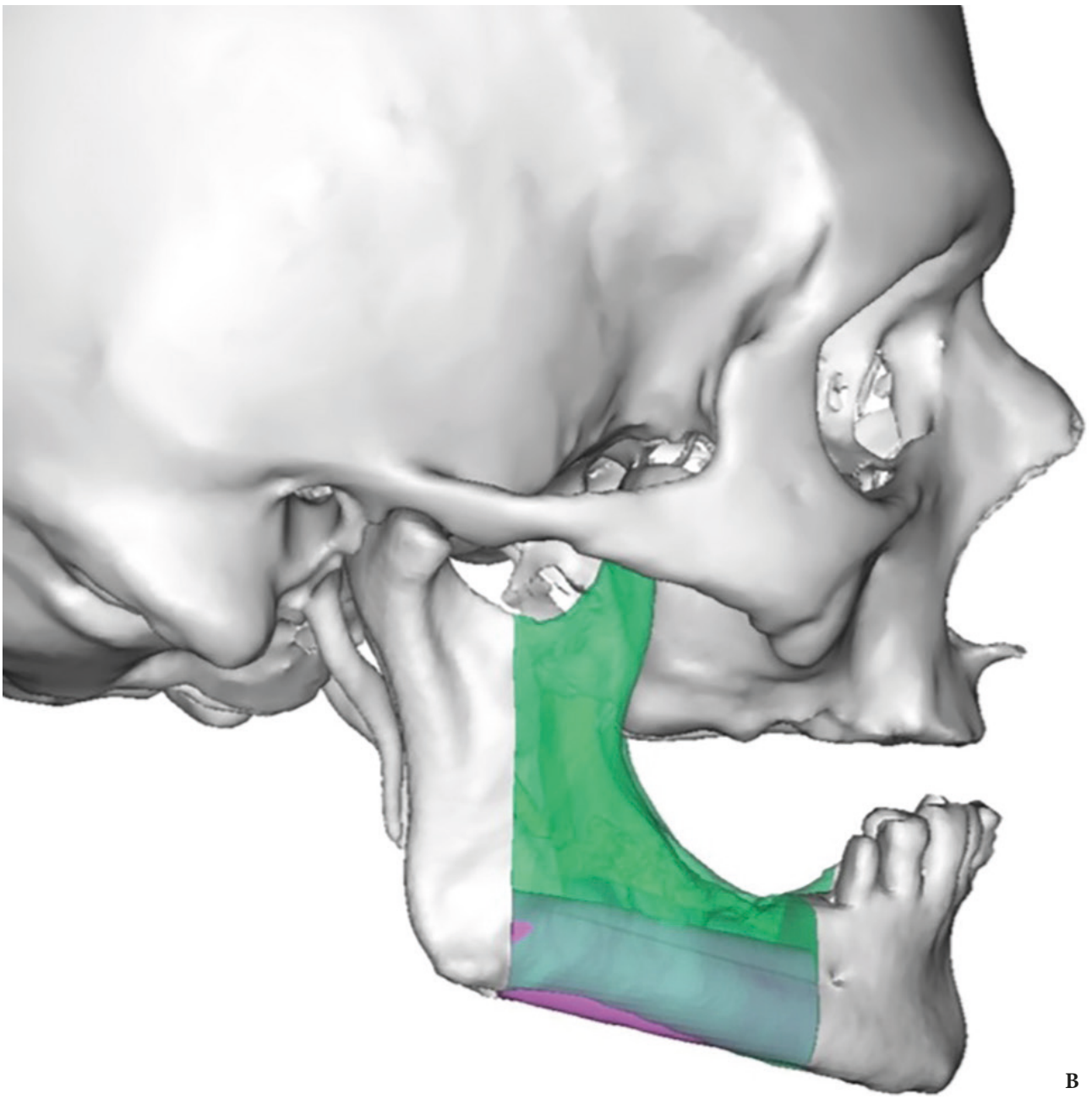
Radiation therapy in the medical history of our patient counted this factor as unfavorable according to Lapis et al classification (Table 6) of potential factors influencing the decision to eliminate elective tracheotomy in head neck reconstruction.[18] So, the reasoned decision to perform preoperative tracheotomy was done.

The fibula harvesting and segmental mandibular reconstruction using reconstruction plate (Fig 3) were preceded by conventional open tracheotomy, intubation, and feeding tube insertion.



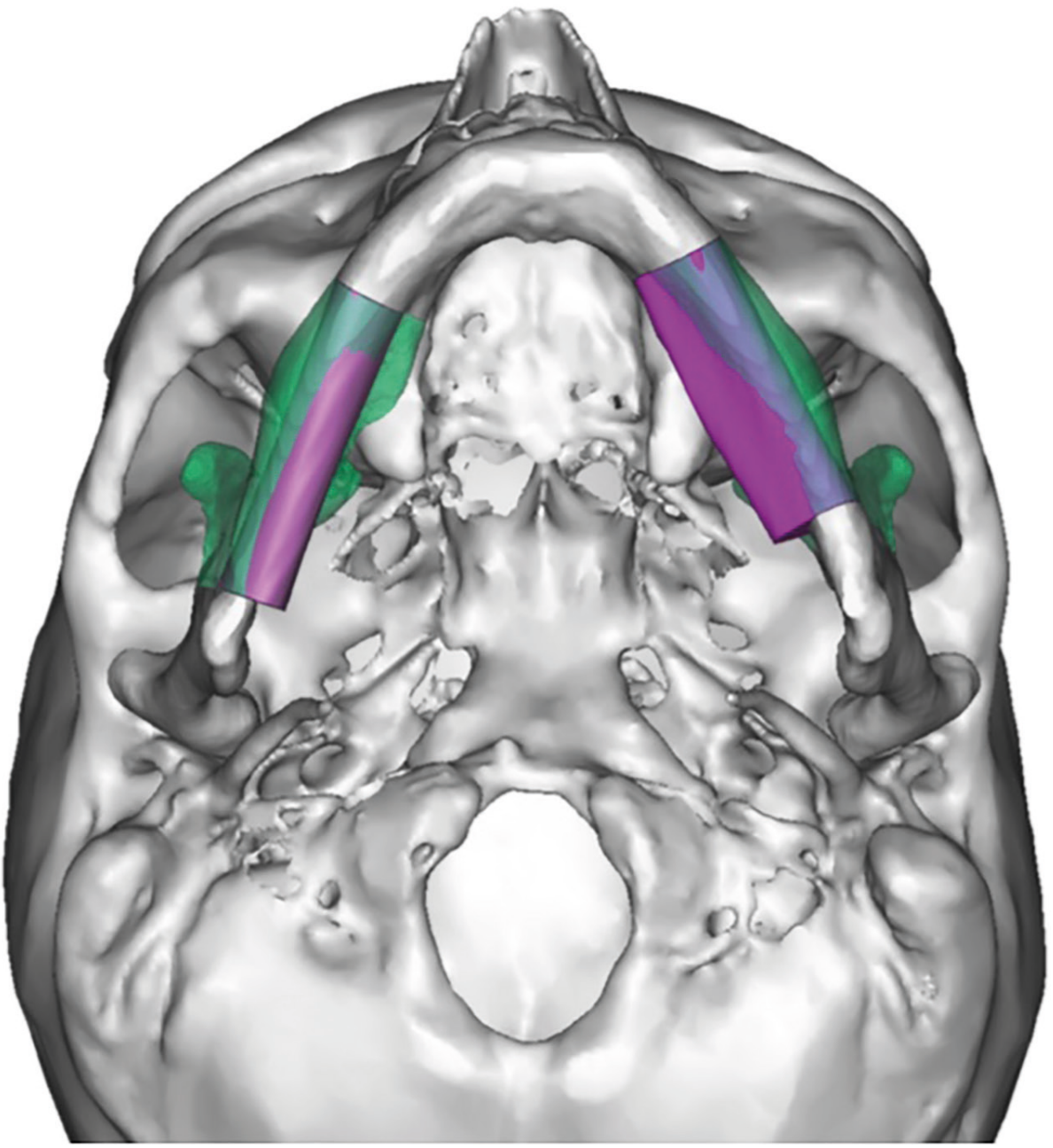
A

FIGURE 1. Three dimensional planning of resection site (marked with *green*) and free fibula graft (marked with *blue* and *pink*) on the left mandibular body (**A**). **(Fig 1 continued on next page.)**



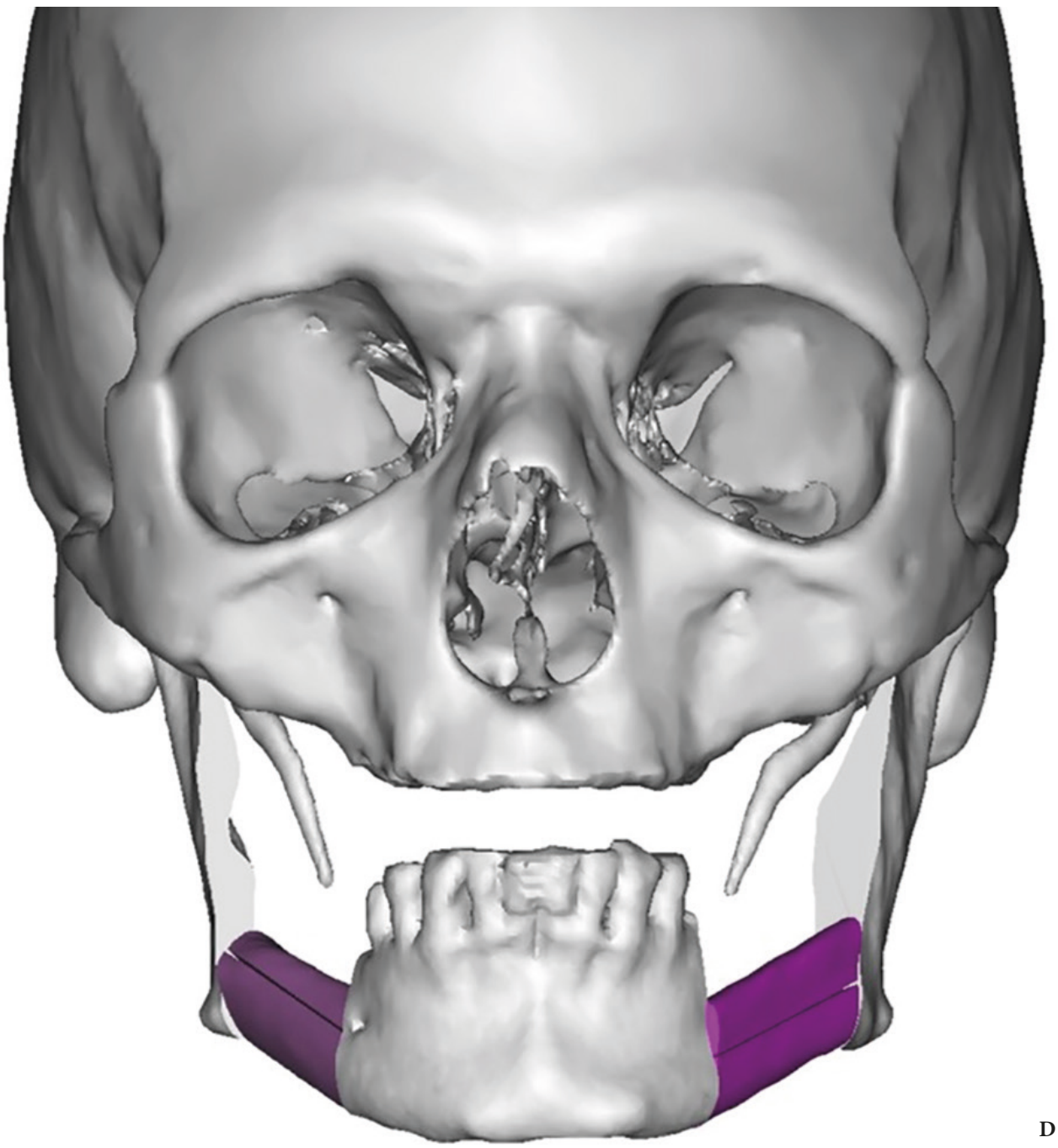
B

FIGURE 1 (cont'd). Three dimensional planning of resection site (marked with *green*) and free fibula graft (marked with *blue* and *pink*) on the right mandibular body (**B**). **(Fig 1 continued on next page.)**



C

FIGURE 1 (cont'd). Axial view (**C**) upon three dimensional planning of resection sites (marked with *green*) and free fibula grafts (marked with *blue* and *pink*) on the bilateral mandibular sites. **(Fig 1 continued on next page.)**



D

FIGURE 1 (cont'd). Anterior view (**D**) upon three dimensional planning for reconstruction with free fibula grafts (marked with *pink*) of the bilateral mandibular bodies.

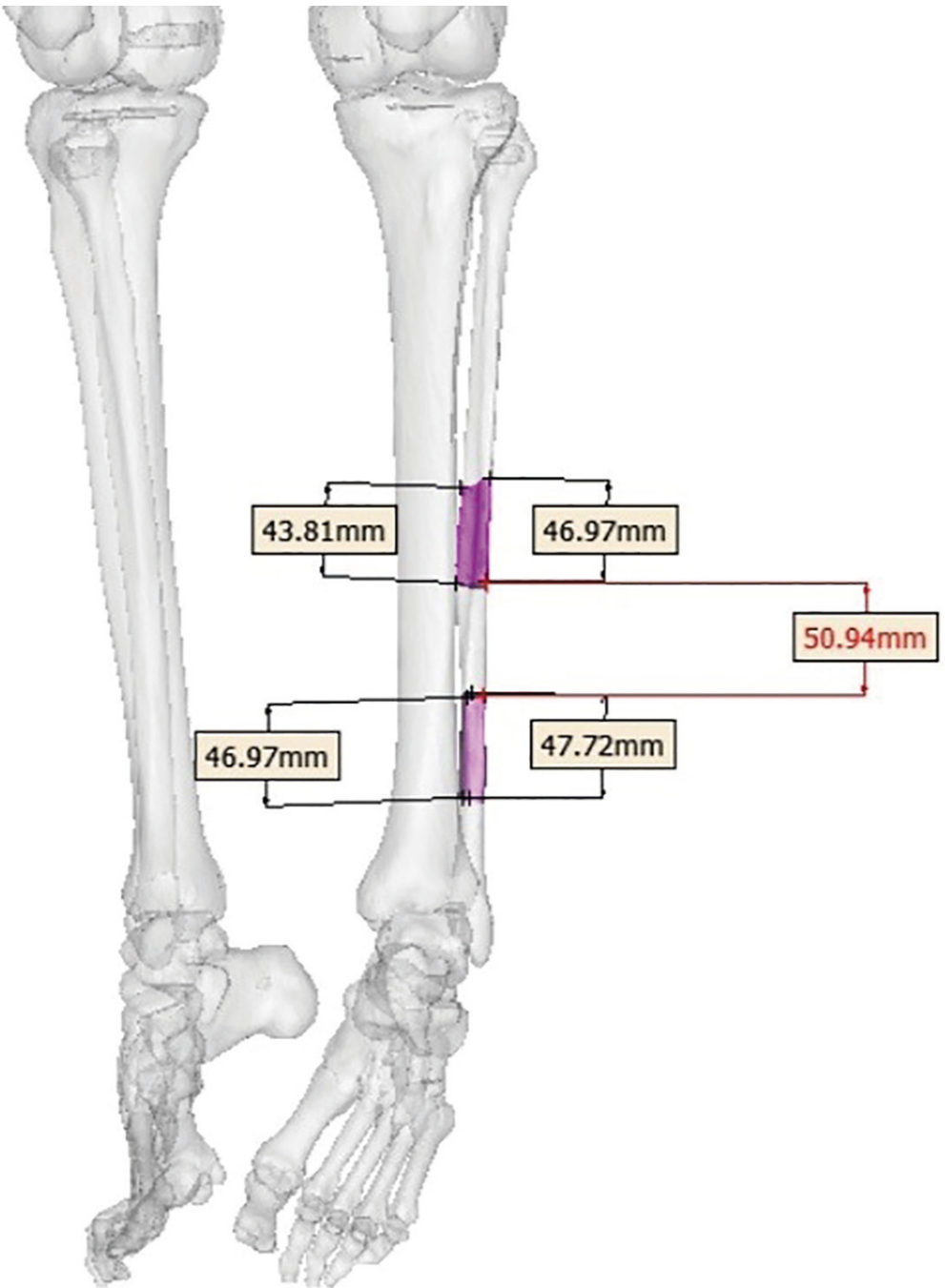


FIGURE 2. Three dimensional (3D) planning of free fibula grafts on a left fibula. The length of fibular segments: *1)* 46.97 to 47.72 mm – the lower fibula bone segment (marked with *pink*); *2)* 50.94 mm – the middle portion, and *3)* 43.81 to 46.97 mm – the upper fibula bone segment (marked with *pink*).

FIGURE 3. The anterior (**A**) and the left side view (**B**) of a custom titanium reconstructive plate on a stereolithographic model.

TABLE 5. Summary of Studies Investigating Omission of Elective Tracheotomy Placement for Major Oncologic Oral Cavity Resections and Reconstructions According to Lapis et al (2015).[18]

Source	Patients, No	Sites (%)	Free Flap Reconstructions	Patient Without Tracheotomy, No	Airway Complications (%)	Suggested Factors
Crosher et al, 1997[19]	51	Unspecified	Unknown	48	Pneumonia (2%)	Favorable: none identified Unfavorable: none identified
Lin et al, 2003[20]	121	Mandible (1.7%) Maxilla (98.3%)	8	111	Pneumonia (0.9%)	Favorable: none identified Unfavorable: mandibulectomy, bulky flap reconstruction
Kruse-Losler et al, 2005[21]	152	Oropharynx (100%)	152	152 (preoperation) 114 (postoperation)	Not specified	Favorable: none identified Unfavorable: tumor size, posterior tumor location, pathologic chest x-ray, alcohol consumption, multimorbidity
Cameron et al, 2009[22]	148	Mandible (31.4%) Oropharynx (14.3%) Other oral orcutaneous site (54.3%)	46+[a]	103	Aspiration pneumonia (1.4%)	Favorable: none identified Unfavorable: preoperative radiotherapy
Coyle et al, 2012[23]	55	Mandible (47.3%) Other oral site (52.7%)	55	55	Pneumonia (9.1%)	Favorable: none identified Unfavorable: none identified
Brickman et al, 2013[24]	143	Maxilla (100%)	143	79	Pneumonia or acute respiratory distress syndrome (4.2%) Aspiration (0.7%) Pneumothorax (0.7%)	Favorable: none identified Unfavorable: Pulmonary disease
Coyle et al, 2013[25]	100	Mandible (45%) Other oral site (55%)	100	50	Pneumonia (24%)	Favorable: none identified Unfavorable: none identifie
Meerwein et al, 2014[26]	40	Oral cavity (47.5%) Other (52.5%)	40	23	None (0%)	Favorable: none identified Unfavorable: none identified
Moubayed et al, 2014[27]	66	Mandible (100%)	66	66	Airway obstruction (1.5%) Aspiration pneumonia (3.0%)	Favorable: benign pathologic findings Unfavorable: tongue/pharynx soft-tissue defects, bilateral parasymphyseal defects, concurrent neck dissection
Lapis et al, 2015[18]	15	Mandible (100%)	15	15	None (0%)	Favorable: lateral defect, limited soft-tissue involvement, younger patients. Unfavorable: history of treatments (surgery, radiation)

[a] *46 radial forearm free flaps are identified; but, the co-authors list an additional undifferentiated combination of forty-nine pedicle and free flaps.*[22]

TABLE 6. Lapis et al Classification of Potential Factors Influencing the Decision to Eliminate Elective Tracheotomy in Head Neck Reconstructions.[18]

Favorable/ Unfavorable/Unknown	Potential Factors
Favorable	Normal upper airway anatomy
	Lateral defects
	Primary osseous pathologies with limited soft-tissue involvement
	Length of mandibular defect is not a limitation
Unfavorable	Difficult airway, trismus
	Extensive soft-tissue defects
	Oropharyngeal and posterior oral cavity defects
	History of radiotherapy
	Active pulmonary disease
Unknown	Bilateral central mandibular defects
	Age

The surgery was done under general anesthesia. First, a bilateral segmental mandibular osteotomy was performed removing radiation injured bone tissue. Then, we used the fibula approach well described in the Wolff and Hölzle masterpiece *Raising of Microvascular Flaps: A Systematic Approach*.[29] The harvesting of the fibula grafts were performed by implementing classic technique for harvesting fibula osteocutaneous transplant using CAD-CAM generated osteotomy guides (Fig 4). Video (Supplemental Video Content) demonstrates surgical stages: cutting of the fibula grafts, harvesting of the segmented grafts from left fibula. Video is available in the page of the full-text article on dtjournal.org and in the YouTube channel, available at https://youtu.be/_Tv8Cbt-HCA. Total video`s duration: 1 min 13 sec. Video includes remarks of a surgeon (Todd Hanna).

RECONSTRUCTION PLATE VERSUS MINI-PLATES

Among many surgeons by 2018 there was the great number of discussions in recommendation what type of the titanium plates is better to use in cases of mandibular reconstructions. Voices from different continents and institutions argued about superior role: *1)* some of the reconstruction plate[30, 31] and *2)* some of the mini-plates[32, 33] upon different types of defects` (Jewer et al[17]) mandibular reconstruction.

Findings of Park et al, 2018[34] putted a reasoned end to this question. As their precise study (8 reconstruction models with biomechanical stability analysis) support the use of a reconstruction plate for stable fixation upon mandibular reconstructions.[34] The mini-plates generate substantially greater levels of stress in majority scenarios and are a less preferable option that has more percentage to fail in the long-term follow-up period.[34]

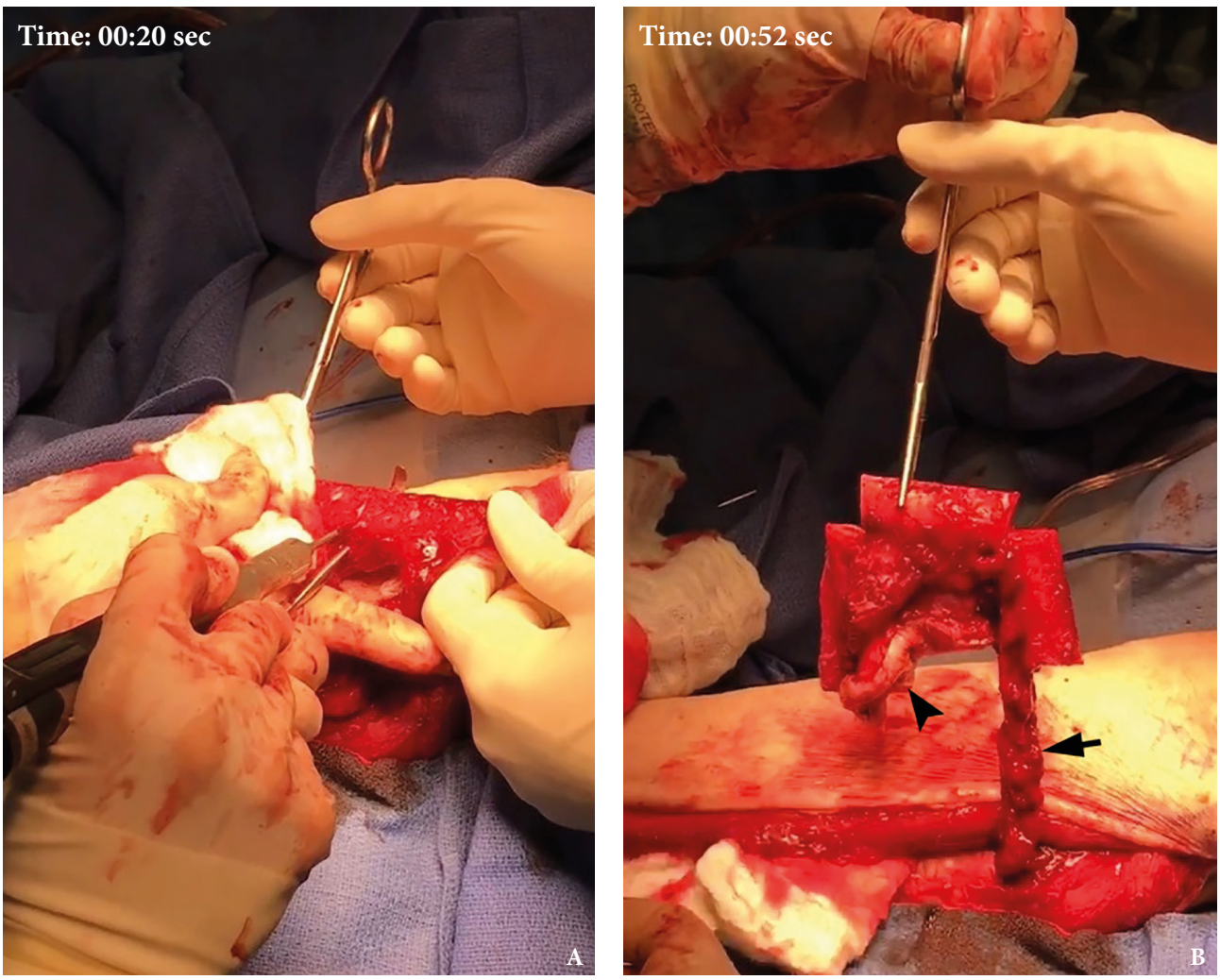
So, in our case we were guided by recommendations of the Korean authors.[34]

IMPROVING MEAN ISCHEMIA TIME

Reducing operative time is always the crucial goal upon surgical procedures. It`s become especially important in cases of using transplants. Berggren et al, 1982 in their study "The effect of prolonged ischemia time on osteocyte and osteoblast survival in composite bone grafts revascularized by microvascular anastomoses" stated that osteocytes, and the osteoblasts could completely survive up to 25 hours of ischemia.[35] Despite of that fact, reducing operating time is always one of the main objectives. And reducing mean ischemia time is significantly better (up to 99 min) when using CAD/CAM comparing with conventional techniques (up to 120-180 min) (Kääriäinen et al, 2016).[36]

SURGICAL PROCEDURE

After resection of the radiation injured mandibular



VIDEO. Supplemental Video Content demonstrates surgical stages: (**A**) cutting of the fibula grafts, (**B**) harvesting of the segmented grafts from left fibula. Vascular pedicle is indicated by *arrow*, skin paddle – by *arrowhead*. Video is available in the page of the full-text article on dtjournal.org and in the YouTube channel, available at https://youtu.be/_Tv8Cbt-HCA

Total video `s duration: 1 min 13 sec.

Video includes remarks of a surgeon (Todd Hanna).

QR code leads to that video at *Journal*`s YouTube channel
Video DTJournal

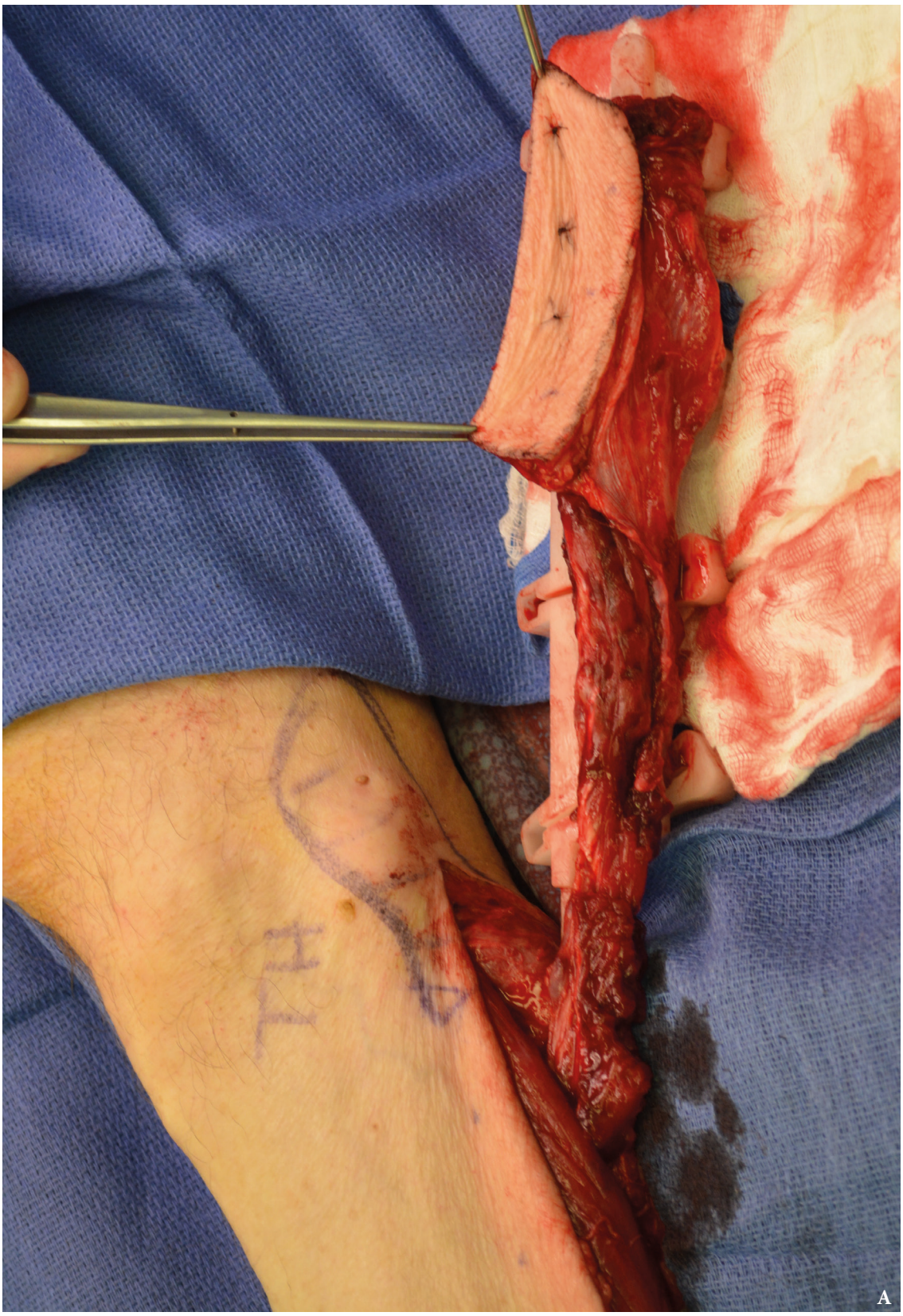


FIGURE 4. Intraoperative fibula view shows: (**A**) the CAD-CAM generated osteotomy guides and a whole length of harvested fibula osteocutaneous transplant. **(Fig 4 continued on next page.)**

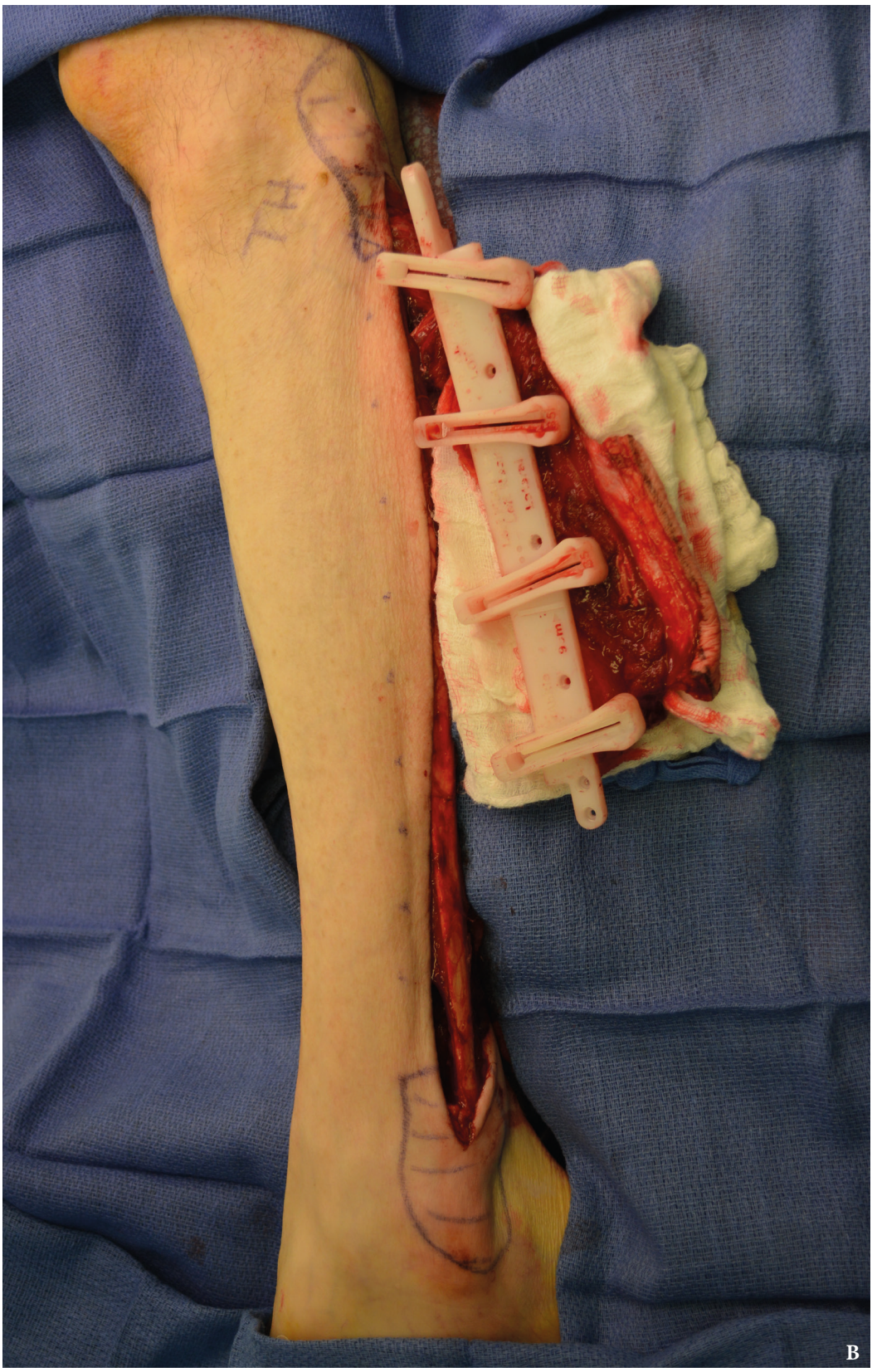


FIGURE 4 (cont'd). Intraoperative fibula view shows: (**B**) precise result of using the CAD-CAM generated osteotomy guides on the left fibula.

bone segments, the lateral segmental mandibular bony defects with a limited soft tissue defect were achieved. Reestablishing vascular supply to the preserved anterior mandibular segment was done by leaving the mucosal and muscular attachments (mylohyoid muscle and genioglossus muscle).

TAILORING OF THE FLAP & OSTEOTOMIES

We used a CAD-CAM generated osteotomy guides to perform a precise guided fibular wedge osteotomies. Each fibula segment should not be cut smaller than 3 cm (Schrag et al, 2006).[14]

SEGMENTS INSETTING

Inferior fibular bone segment was inlayed to the right-side mandibular defect (Fig 5A) and superior fibular bone segment was inlayed to the opposite-side defect (Fig 5B). The reconstruction plate was placed at the defects, along the inferior border of the both mandibular rami and symphysis (Fig 5C). Three bicortical screws were used on the right rami, 3 screws – on the left rami, and 4 screws – on the symphyseal bone fragment. But the fibula grafts were fixed to the plate using only monocortical screws to avoid vascular pedicle injury.[16]

RECIPIENT & DONOR VESSELS PREPARING

Shetawi and Buchbinder in the chapter *Mandibular Reconstruction*[16] emphasize, that importance of the recipient vessel exploration cannot be ignored according to the next requirements:

1. To plan the type of free flap.
2. To plan the orientation of the flap during inset.
3. To plan the need for interpositional vein grafts.

ARTERIAL & VENOUS ANASTOMOSIS

After completing the step of insetting we start to perform next steps, making: *1)* arterial anastomosis and *2)* venous anastomosis. Both are performed using circumferential 9-0 or 10-0 nylon sutures. A brisk pulsatile bleeding is a right sign of a correctly performed arterial anastomosis.[16] Tension or kinking is contraindicated upon laying the pedicle.

Shetawi and Buchbinder insist that it is possible to avoid hematoma formation or infections by making a proper drainage of the neck. According to the recommendation of the authors[16] two different drainage systems can be used:

1. Open (Penrose) – is a soft, flexible rubber tube.
2. Closed (Pratt; *synonym*: Jackson-Pratt) – is an internal vacuum drain connected to a grenade-shaped bulb via plastic tubing.

In our case in the postoperative period we used Penrose drainage in submental region and the Pratt bilateral suction drains (Fig 6).

BASAL & ALVEOLAR BONE RECONSTRUCTION

The fact that the fibula segments` hight is not enough to reconstruct simultaneously the basal and alveolar bone dictate us to choose one of the next techniques, which allows to restore alveolar bone hight:

1. To inset fibula segment 1 cm above the mandibular inferior border.[16]
2. Symphyseal reconstruction is a perfect area to use double-barrel method.[16]
3. Vertical distraction is also an option to build an alveolar hight.[16] But the study of Lizio et al reported that cumulative success rate of the implants inserted into distracted fibula segment at the end of follow-up was only 52%.[37]
4. Onlay grafting.[37]

POSTOPERATIVE CARE FEATURES

The feeding tube is strongly recommended in the postoperative period with next purposes:[16]

1. To ensure healing.
2. To minimize breakdown of the wound and salivary leak.

PREVENTING COMPLICATIONS

Among possible complications in elderly patients the attention should be paid to delirium. This was the most common postoperative medical complication in 18 percent of cases in the report of Yang et al[38] and 35.3 percent of cases in the study of Sugiura et

FIGURE 5. Intraoperative right lateral view (**A**) after fixation of harvested fibula grafts on the bilateral mandibular defects using titanium reconstructive plate. **(Fig 5 continued on next page.)**

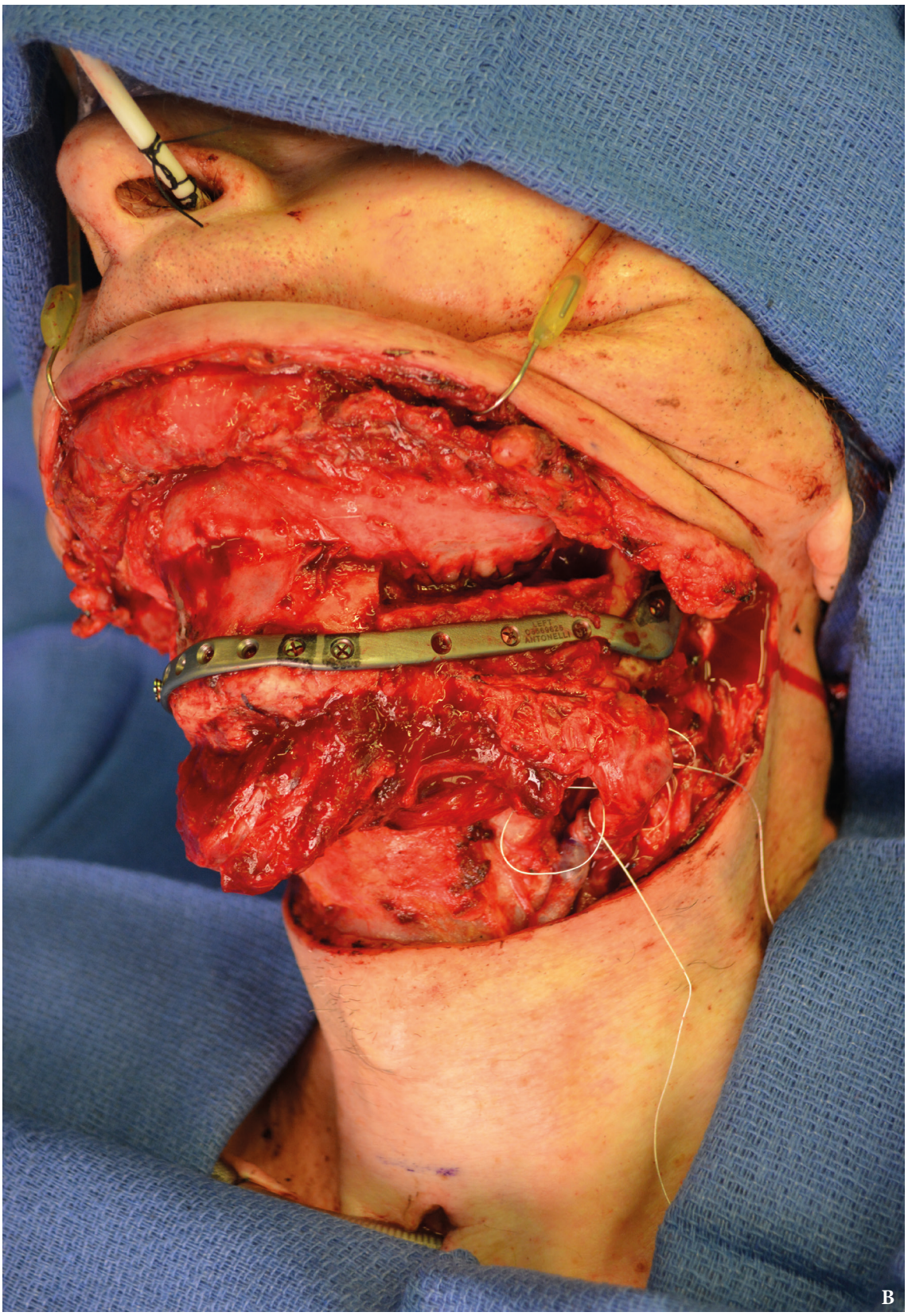


FIGURE 5 (cont'd). Intraoperative left lateral view (**B**) after fixation of harvested fibula grafts on the bilateral mandibular defects using titanium reconstruction plate. **(Fig 5 continued on next page.)**

FIGURE 5 (cont'd). Intraoperative anterior view (**C**) after fixation of harvested fibula grafts on the bilateral mandibular defects using titanium reconstruction plate.

FIGURE 6. Postoperative view immediately after suturing and fixation of a Penrose rubber tubular drain (*arrowhead*) in submental region, and the Pratt vacuum suction drains (*arrows*). Feeding tube is indicated by *curved arrow*.

al.[39] Our successful case of BSMR proved the results (in seventy-three ≥80-year-old patients) of Sugiura et al[39] who suggested that elderly patients tolerate free fibula flap reconstruction. Despite of that, the authors stated that recovery of masticatory function looks difficult, even after performing free fibula flap reconstructive surgeries.[39]

OUTCOME EVALUATION

The present surgical report is comparable to state of the art cases in the literature (Hsu et al, 2011; Chen et al, 2018; Weitz et al, 2018).[40, 9, 41] Postoperative control of reconstruction with 3D-CT showed a perfect position of the transplanted segments (Fig 7). A patient showed success, with excellent flap vitality, nice donor site healing and simple postoperative period despite of the age. 6-month follow-up (Fig 8) shows no signs of complications.

Thus, making the simultaneous bilateral segmental mandibular reconstruction a state of the art procedure is possible only in case of making its` every step (Fig 9) as perfect as possible according to the latest research data.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

ROLE OF CO-AUTHORS

The authors are equally contributed to that paper.

FUNDINGS

No funding was received for this study.

FIGURE 7. Postoperative control of reconstruction with 3D-CT: Anterior view (**A**). **(Fig 7 continued on next page.)**

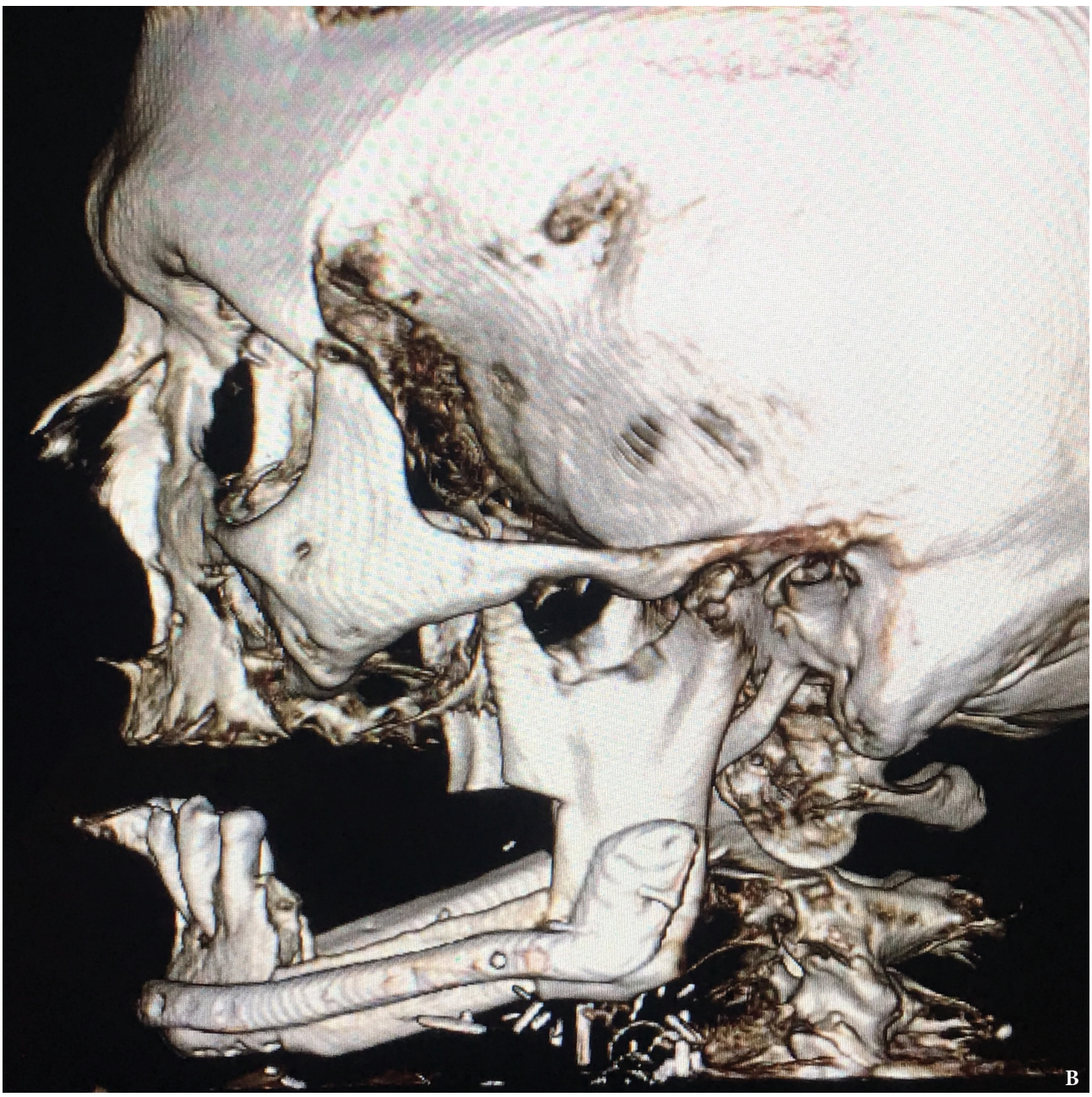


FIGURE 7 (cont'd). Postoperative control of reconstruction with 3D-CT: Left lateral view (**B**). **(Fig 7 continued on next page.)**

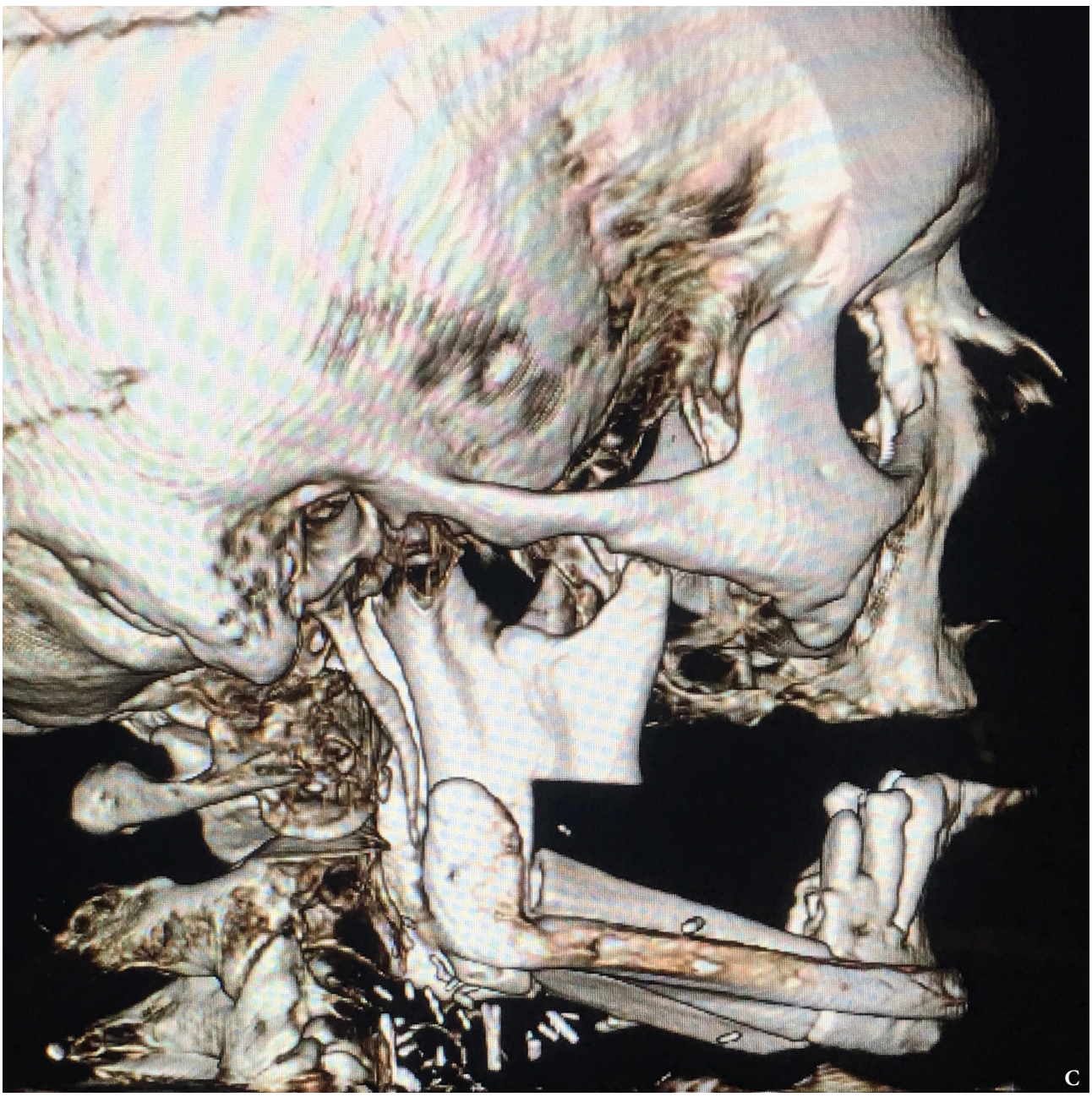


FIGURE 7 (cont'd). Postoperative control of reconstruction with 3D-CT: Right lateral view (**C**). **(Fig 7 continued on next page.)**

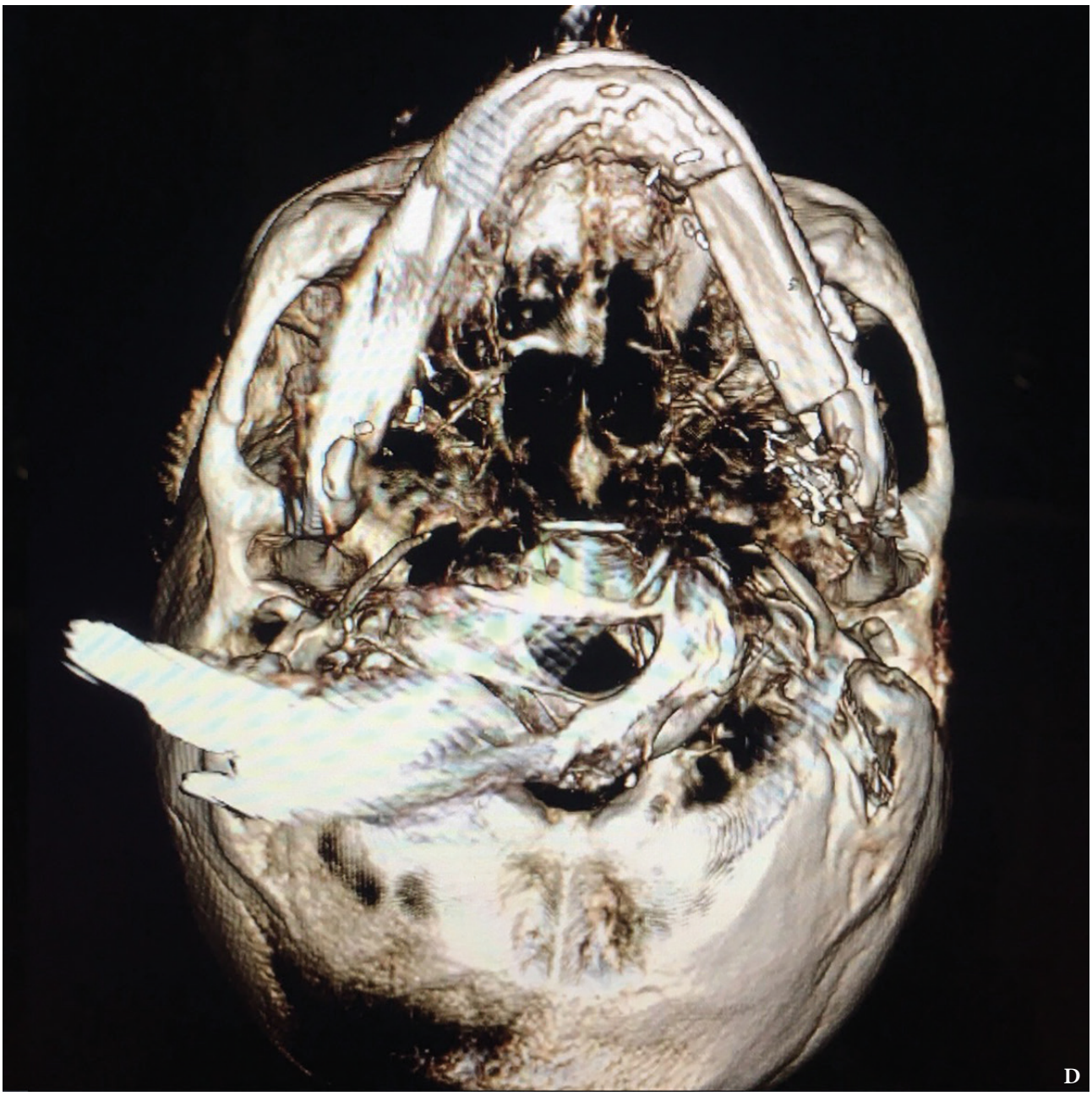


FIGURE 7 (cont'd). Postoperative control of reconstruction with 3D-CT: Axial view (**D**).

FIGURE 8. 6-month follow-up: Anterior view (**A**). A gentle scar (*arrow*) is hidden in the natural folds of the neck. **(Fig 8 continued on next page.)**

FIGURE 8 (cont'd). 6-month follow-up: Left lateral view (**B**). A gentle scar (*arrow*) is hidden in the natural folds of the neck.

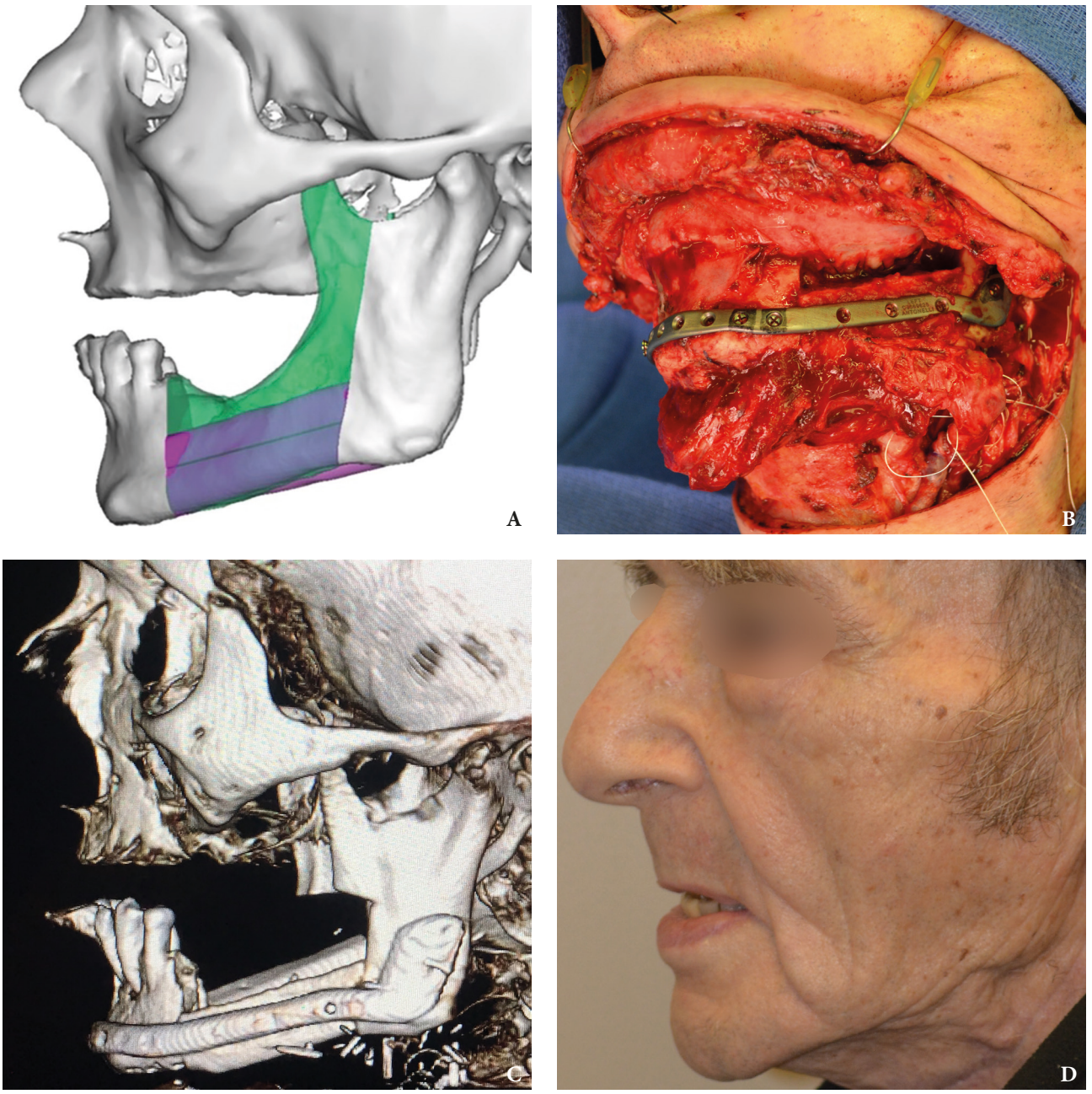


FIGURE 9. Consecutive images are illustrating the stages of the bilateral segmental mandibular reconstruction: Preoperative 3D planning (**A**), intraoperative view after fibular graft inlay and reconstructive plate fixation (**B**), postoperative CT view (**C**), and 6-month follow-up photography (**D**).

REFERENCES

1. Hidalgo DA. Fibula free flap: a new method of mandible reconstruction. *Plast Reconstr Surg* **1989**;84(1):71–9.
2. Qaisi M, Kolodney H, Swedenburg G, Chandran R, Caloss R. Fibula jaw in a day: state of the art in maxillofacial reconstruction. *J Oral Maxillofac Surg* **2016**;74(6):1284.e1–1284.e15. https://doi.org/10.1016/j.joms.2016.01.047.
3. Su T, Fernandes RP. Microvascular reconstruction of the mandible: an argument for the fibula osteocutaneous free flap. *Revista Española de Cirugía Oral y Maxilofacial* **2014**;36(2):1–8. https://doi.org/10.1016/j.maxilo.2012.06.002.
4. Fernandes RP, Quimby A, Salman S. Comprehensive reconstruction of mandibular defects with free fibula flaps and endosseous implants. *J Diagn Treat Oral Maxillofac Pathol* **2017**;1(1):6–10. https://doi.org/10.23999/j.dtomp.2017.1.1.
5. Reychler H, Iriarte Ortabe J, Lambert F. Bilateral mandibular angle reconstruction with a single free vascularised fibula flap. *Plast Reconstr Surg* **1997**;99(5):1411–4.
6. Bianchi B, Copelli C, Ferrari S, Ferri A, Sesenna E. Bilateral mandibular reconstruction with a single vascularised fibula flap. A case report. *J Plast Reconstr Aesthet Surg* **2008**;61(10):1252–4. https://doi.org/10.1016/j.bjps.2007.12.056.
7. Mello-Filho FV, Brigato RR, Eichenberger GC, Xavier SR, Mamede RC. Reconstruction of two defects with one fibular flap. *Am J Otolaryngol* **2008**;29(3):218–21. https://doi.org/10.1016/j.amjoto.2007.07.003.
8. Jacobson AS, Buchbinder D, Urken ML. Reconstruction of bilateral osteoradionecrosis of the mandible using a single fibular free flap. *Laryngoscope* **2010**;120(2):273–5. https://doi.org/10.1002/lary.20717.
9. Chen R, Zhang HQ, Huang ZX, Li SH, Zhang DM, Huang ZQ. Computer-assisted resection and reconstruction of bilateral osteoradionecrosis of the mandible using 2 separate flaps prepared from a single fibula. *Oral Surg Oral Med Oral Pathol Oral Radiol* **2018**;126(2):102–6. https://doi.org/10.1016/j.oooo.2018.02.019.
10. Ekanayake K, Thomas DG, Brennan PA. Reconstruction of a bilateral mandibular defect due to trauma using a single fibula free flap. *J Oral Maxillofac Surg* **2013**;71(10):1724–8. https://doi.org/10.1016/j.joms.2013.06.195.
11. Tymofieiev OO. Manual of maxillofacial and oral surgery [Russian]. 5th ed. Kyiv: Chervona Ruta-Turs; **2012**.
12. Tymofieiev OO, Tymofieiev OO. Osteoradionecrosis of the jaws: report of nineteen consecutive cases. *J Diagn Treat Oral Maxillofac Pathol* **2018**;2(1):51–6. http://dx.doi.org/10.23999/j.dtomp.2018.2.5.
13. Chronopoulos A, Zarra T, Ehrenfeld M, Otto S. Osteoradionecrosis of the jaws: definition, epidemiology, staging and clinical and radiological findings. A concise review. *Int Dent J* **2018**;68(1):22–30. https://doi.org/10.1111/idj.12318.
14. Schrag C, Chang Y-M, Tsai C-Y, Wei F-C. Complete rehabilitation of the mandible following segmental resection. *J Surg Oncol* **2006;**94(6):538–45. https://doi.org/doi:10.1002/jso.20491.
15. Bae DS, Waters PM. Free vascularized fibula grafting: principles, techniques, and applications in pediatric orthopaedics. www.orthojournalhms.org/ volume 8:1–4.
16. Kuriakose MA. Contemporary oral oncology: oral and maxillofacial reconstructive surgery. 1st ed. Cham: Springer; **2017**. https://doi.org/10.1007/978-3-319-43857-3.
17. Jewer DD, Boyd JB, Manktelow RT, Zuker RM, Rosen IB, Gullane PJ, Rotstein LE, Freeman JE. Orofacial and mandibular reconstruction with the iliac crest free flap: a review of 60 cases and a new method of classification. *Plast Reconstr Surg* **1989;**84(3):391–403; discussion 404-5.
18. Lapis PN, DeLacure MD, Givi B. Factors in successful elimination of elective tracheotomy in mandibular reconstruction with microvascular tissue. *JAMA Otolaryngol Head Neck Surg* **2016**;142(1):46–51. https://doi.org/10.1001/jamaoto.2015.2845.
19. Crosher R, Baldie C, Mitchell R. Selective use of tracheostomy in surgery for head and neck cancer: an audit. *Br J Oral Maxillofac Surg* **1997**;35(1):43–5.
20. Lin HS, Wang D, Fee WE, Goode RL, Terris DJ. Airway management after maxillectomy: routine tracheostomy is unnecessary. *Laryngoscope* **2003**;113(6):929–32. https://doi.org/10.1097/00005537-200306000-00002.
21. Kruse-Lösler B, Langer E, Reich A, Joos U, Kleinheinz J. Score system for elective tracheotomy in major head and neck tumour surgery. *Acta Anaesthesiol Scand* **2005**;49(5):654–9. https://doi.org/10.1111/j.1399-6576.2005.00655.x.
22. Cameron M, Corner A, Diba A, Hankins M. Development of a tracheostomy scoring system to guide airway management after major head and neck surgery. *Int J Oral Maxillofac Surg* **2009**;38(8):846–9. https://doi.org/10.1016/j.ijom.2009.03.713.
23. Coyle MJ, Shrimpton A, Perkins C, Fasanmade A, Godden D. First do no harm: should routine tracheostomy after oral and maxillofacial oncological operations be abandoned? *Br J Oral Maxillofac Surg* **2012**;50(8):732–5. https://doi.org/10.1016/j.bjoms.2012.01.003.

24. Brickman DS, Reh DD, Schneider DS, Bush B, Rosenthal EL, Wax MK. Airway management after maxillectomy with free flap reconstruction. *Head Neck* **2013**;35(8):1061–5. https://doi.org/10.1002/hed.23082.

25. Coyle MJ, Tyrrell R, Godden A, Hughes CW, Perkins C, Thomas S, Godden D. Replacing tracheostomy with overnight intubation to manage the airway in head and neck oncology patients: towards an improved recovery. *Br J Oral Maxillofac Surg* **2013**;51(6):493–6. https://doi.org/10.1016/j.bjoms.2013.01.005.

26. Meerwein C, Pezier TF, Beck-Schimmer B, Schmid S, Huber GF. Airway management in head and neck cancer patients undergoing microvascular free tissue transfer: delayed extubation as an alternative to routine tracheotomy. *Swiss Med Wkly* **2014**;144:w13941. https://doi.org/0.4414/smw.2014.13941.

27. Moubayed SP, Barker DA, Razfar A, Nabili V, Blackwell KE. Microvascular reconstruction of segmental mandibular defects without tracheostomy. *Otolaryngol Head Neck Surg* **2015**;152(2):250–4. https://doi.org/10.1177/0194599814556625.

28. Stathopoulos P, Stassen L. A modification of the Bjork flap in tracheostomies for head and neck cancer patients. *J Stomatol Oral Maxillofac Surg* **2018**;119(5):444–5. https://doi.org/10.1016/j.jormas.2018.04.018.

29. Wolff K-D, Hölzle R. Raising of microvascular flaps: a systematic approach. 2nd ed. Cham: Springer; **2011**. https://doi.org/10.1007/978-3-642-13831-7.

30. Wittwer G, Adeyemo WL, Turhani D, Ploder O. Treatment of atrophic mandibular fractures based on the degree of atrophy— experience with different plating systems: a retrospective study. *J Oral Maxillofac Surg* **2006**;64(2):230–4. https://doi.org/10.1016/j.joms.2005.10.025.

31. Bao T, He J, Yu C, Zhao W, Lin Y, Wang H, Liu J, Zhu H. Utilization of a pre-bent plate-positioning surgical guide system in precise mandibular reconstruction with a free fibula flap. *Oral Oncol* **2017**;75:133–9. https://doi.org/10.1016/j.oraloncology.2017.11.011.

32. Mugino H, Takagi S, Oya R, Nakamura S, Ikemura K. Miniplate osteosynthesis of fractures of the edentulous mandible. *Clin Oral Investig* **2005**;9:266–70. https://doi.org/10.1007/s00784-005-0012-5.

33. Bujtar P, Simonovics J, Varadi K, Sandor GK, Avery CME. The biomechanical aspects of reconstruction for segmental defects of the mandible: a finite element study to assess the optimisation of plate and screw factors. *J Craniomaxillofac Surg* **2014**;42(6):855–62. https://doi.org/10.1016/j.jcms.2013.12.005.

34. Park SM, Lee JW, Noh G. Which plate results in better stability after segmental mandibular resection and fibula free flap reconstruction? Biomechanical analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol* **2018**;126(5):380–9. https://doi.org/10.1016/j.oooo.2018.05.048.

35. Berggren A, Weiland AJ, Dorfman H. The effect of prolonged ischemia time on osteocyte and osteoblast survival in composite bone grafts revascularized by microvascular anastomoses. *Plast Reconstr Surg* **1982**;69(2):290–8.

36. Kääriäinen M, Kuuskeri M, Gremoutis G, Kuokkanen H, Miettinen A, Laranne J. Utilization of three-dimensional computer-aided preoperative virtual planning and manufacturing in maxillary and mandibular reconstruction with a microvascular fibula flap. *J Reconstr Microsurg* **2016**;32(2):137–41. https://doi.org/10.1055/s-0035-1563396.

37. Lizio G, Corinaldesi G, Pieri F, Marchetti C. Problems with dental implants that were placed on vertically distracted fibular free flaps after resection: a report of six cases. *Br J Oral Maxillofac Surg* **2009**;47(6):455–60. https://doi.org/10.1016/j.bjoms.2009.06.002.

38. Yang R, Lubek JE, Dyalram D, Liu X, Ord RA. Head and neck cancer surgery in an elderly patient population: a retrospective review. *Int J Oral Maxillofac Surg* **2014**;43(12):1413–7. https://doi.org/10.1016/j.ijom.2014.08.008.

39. Sugiura Y, Sarukawa S, Hayasaka J, Kamochi H, Noguchi T, Mori Y. Mandibular reconstruction with free fibula flaps in the elderly: a retrospective evaluation. *Int J Oral Maxillofac Surg* **2018**;47(8):983–9. https://doi.org/10.1016/j.ijom.2018.02.009.

40. Hsu WK, Lo CH, Lee FH, Su WC, Lin TS, Pai H. The timing of tracheostomy extubation in head and neck cancer patients. *J Oral Maxillofac Surg* **2011**;40(10):1069. https://doi.org/10.1016/j.ijom.2011.07.146.

41. Weitz J, Wolff KD, Kesting MR, Nobis CP. Development of a novel resection and cutting guide for mandibular reconstruction using free fibula flap. *J Craniomaxillofac Surg* **2018**;46(11):1975–8. https://doi.org/10.1016/j.jcms.2018.09.007.

Hanna TC, Kraus DH.
State of the art simultaneous bilateral segmental mandibular reconstruction using a single fibula transplant: discussion of the surgical steps.
J Diagn Treat Oral Maxillofac Pathol **2019**;3(3):76–103.
http://dx.doi.org/10.23999/j.dtomp.2019.3.2.

Dental Implants & Bone Augmentation Techniques: Case Report

Avoiding Risks at the Maxilla upon Titanium Mesh Fixation for the Guided Bone Regeneration

Ivan V. Nagorniak[a,*] and Kateryna Yu. Nagorniak[b]

The mesh protected space is then colonized by osteogenic cell populations resulting in new bone formation.[1]
—Marco Rasia dal Polo et al, 2014
Italy

INTRODUCTION/SUMMARY

Titanium mesh[1] (TiMe) is one of the popular tools in the guided bone regeneration (GBR). According to Zita Gomes et al (2016)[2] the surgical principle of GBR involves the placement of a mechanical barrier for the protection of the blood clot and the isolation of the bone defect from the surrounding connective tissues. Those measures will facilitate the selective recruitment of the mesenchymal cells responsible for the formation of a new bone tissue.[2-6] And in some cases the mesh fixation method can be challenging to some conditions. So, the goals of our report are *1)* to show the brief case of dental implants placement with simultaneous titanium mesh by non-osseous fixation in a 45-year-old lady and *2)* to discuss the paths how to avoid the risks at the maxilla upon that type of surgery.

CASE

A 45-year-old white female referred to our clinic with a diagnosis radicular cyst of a tooth #24 and absence of the teeth #25 and #27. After delivery of local anesthesia (3.4 ml Ultracain D-S forte, Frankfurt, Aventis Pharma Deutschland GmbH) we performed an incision; the full-thickness palatal and labial flaps were reflected. After atraumatic removal of tooth #24, we removed a cyst (Fig 1A). The complete buccal plate perforation was noted (Fig 1B). Three implants (U-Impl, Biel, Switzerland; 15 × 3.5 mm, 13 × 3.5 mm and 8.5 × 4 mm) were placed in the position of the teeth #24, 25 and 27 (Fig 1C). Each implant was placed bicortically. A TiMe (small mesh plate 25- × 35-mm in size and 0.1-mm in thickness, BioMaterials, Seoul, Republic of Korea) was trimmed and contoured to the ridge shape with a purpose to guarantee the guided bone regeneration in the area of buccal plate perforation. The mesh was fixed (Fig 1D) with one cover screw (U-Impl, Biel, Switzerland) to the implant in area with absent tooth #25. The flap was sutured (VICRYL, Ethicon, USA; 5-0 coated) without tension. Postoperative panoramic x-ray (Fig 2) is clearly demonstrating the implants position. In the postoperative period no mesh exposure was noted.

[a] DDS, PhD; Private Dental Practice, Kyiv, Ukraine.

[b] DDS, PhD Student; Department of Therapeutic Dentistry, Stomatology Institute, Shupyk National Medical Academy of Postgraduate Education, Kyiv, Ukraine.

** Corresponding author. Private Dental Practice, 6-G Andruschenka Street, Office 6, Kyiv 01135, Ukraine. Phone: +380674088131 E-mail: ivan.nagorniak@gmail.com (Ivan V. Nagorniak)*

Paper received 15 March 2019
Accepted 26 March 2019
Available online 31 March 2019
http://dx.doi.org/10.23999/j.dtomp.2019.3.3.

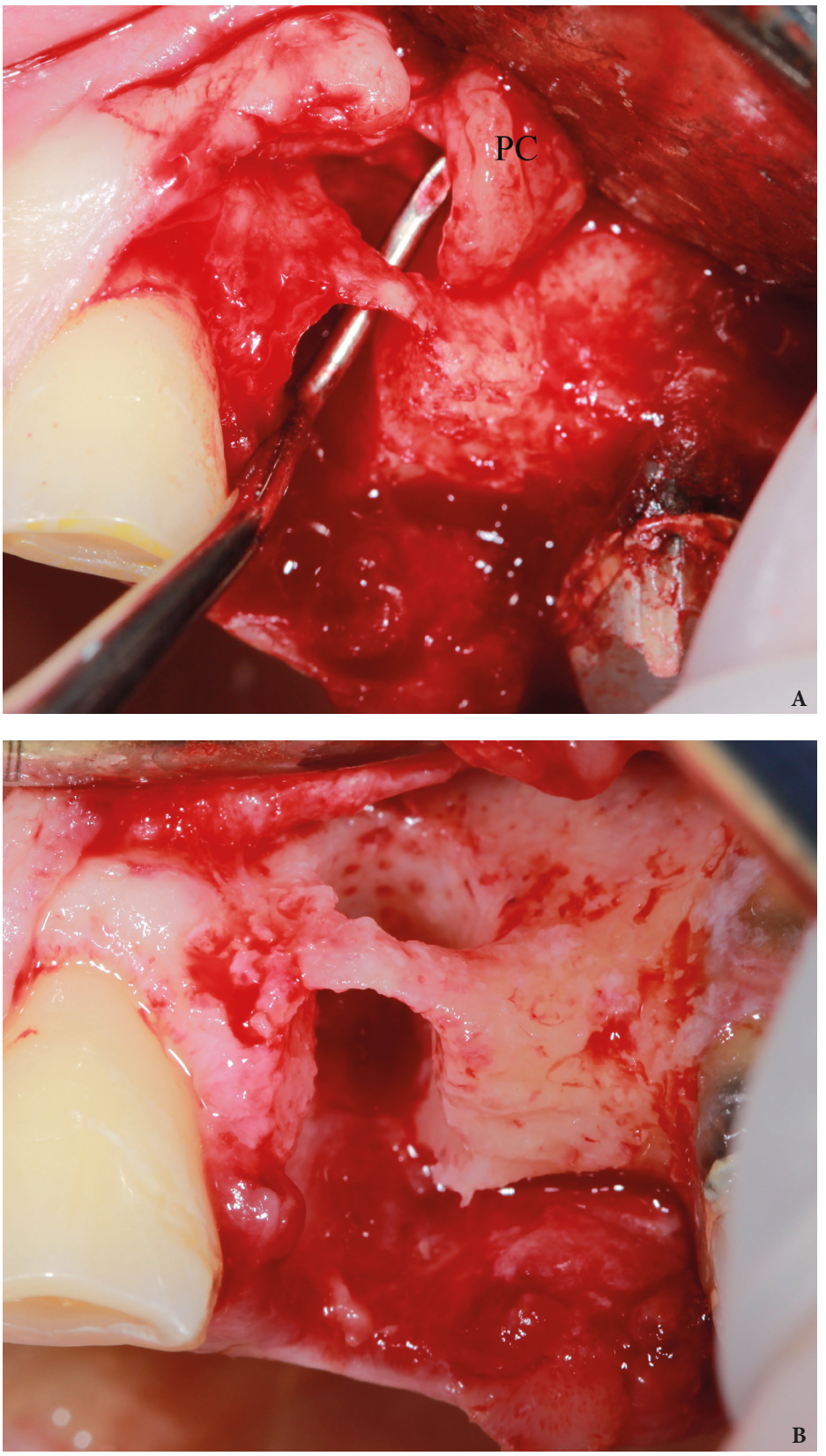


FIGURE 1. Intraoperative view: **A** – immediately after tooth #24 extraction and during periapical cyst (*PC*) removal, **B** – alveolar ridge is prepared for implants placement. **(Fig 1 continued on next page.)**

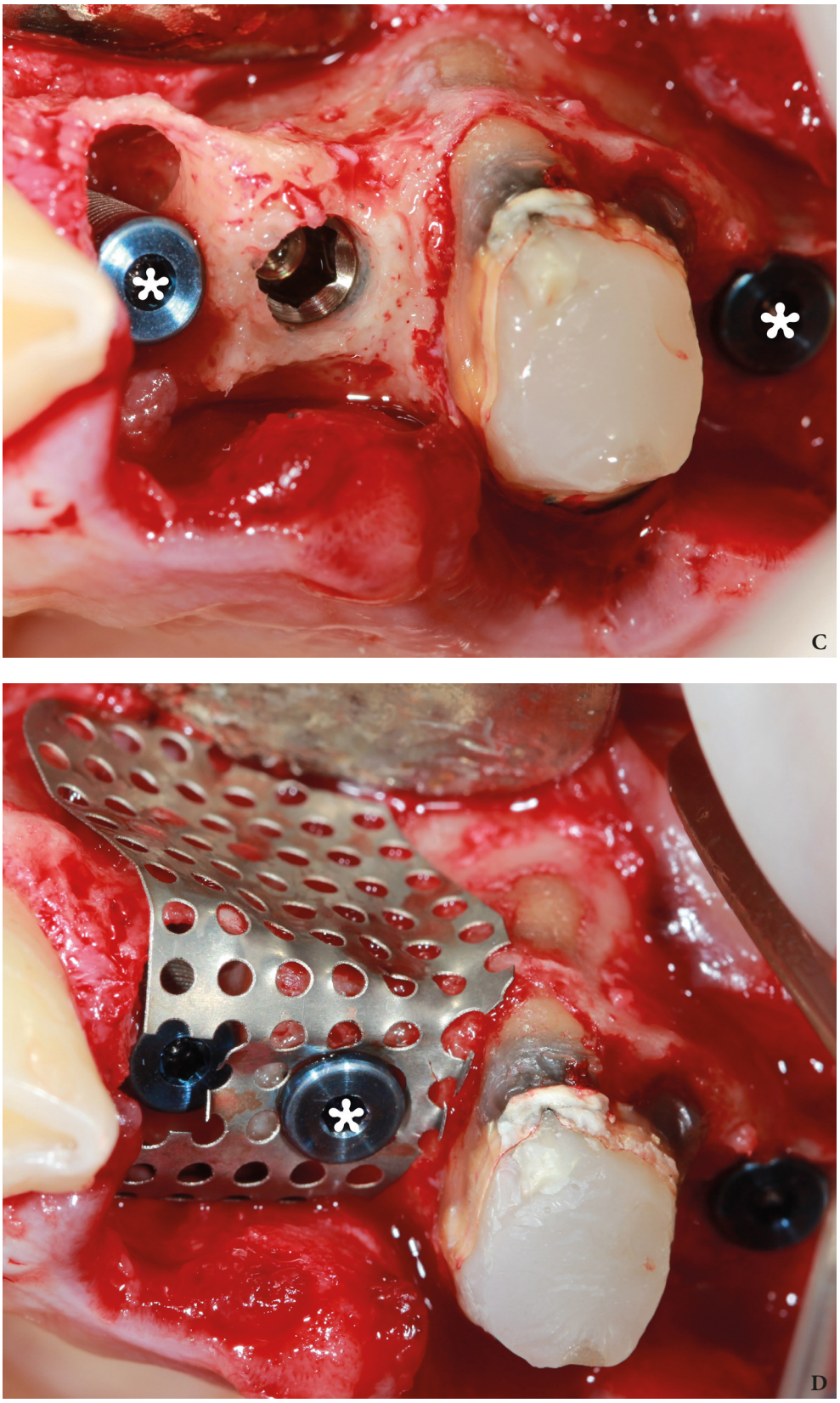


FIGURE 1 (cont'd). Intraoperative view: **C** – three implants and two cover screws (*asterisks*) were placed, **D** – titanium mesh is banded and fixed with one cover screw (*asterisk*) to implant #25.

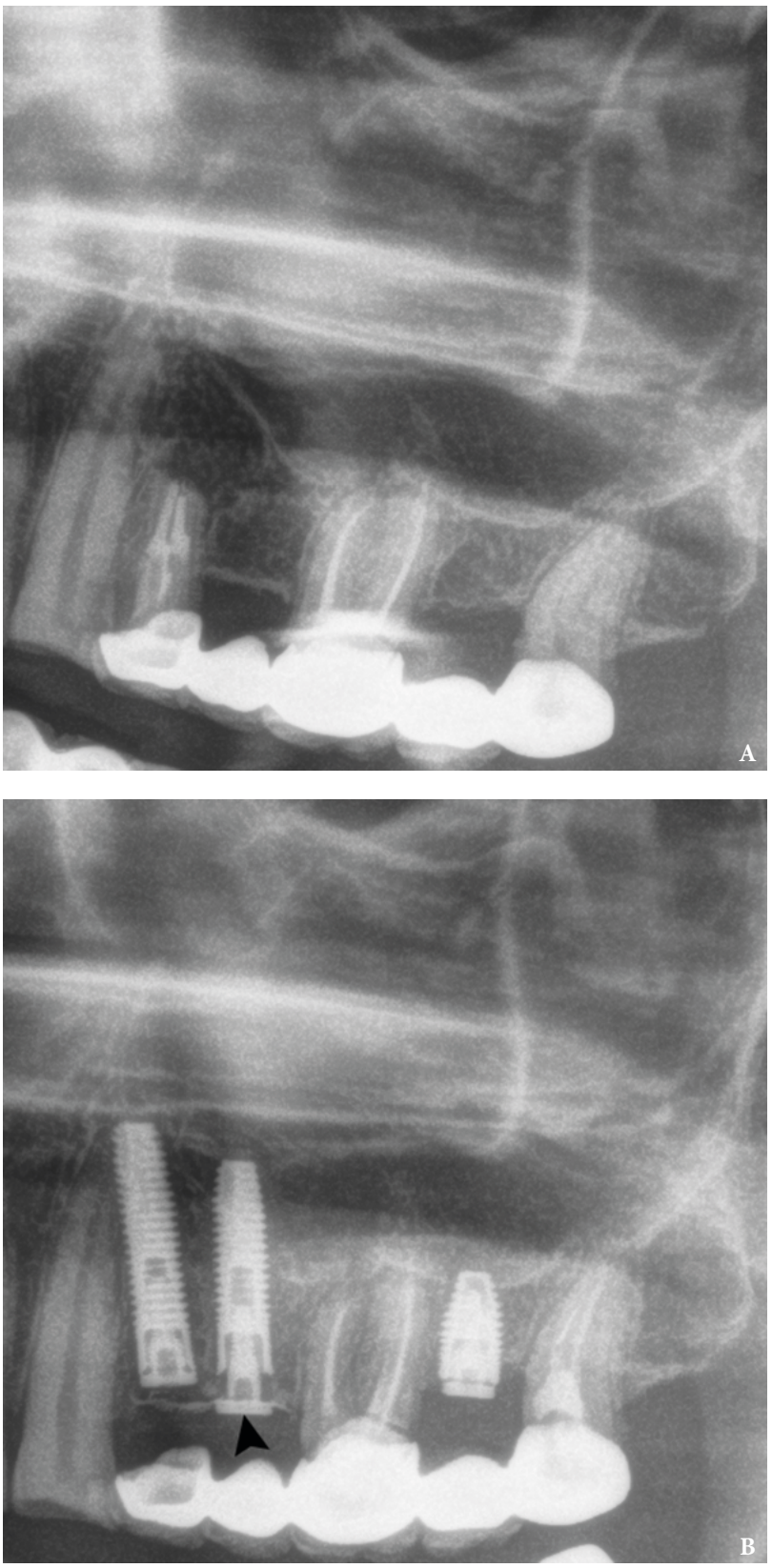


FIGURE 2. Preoperative (**A**) and postoperative (**B**) panoramic radiography. Cover screw that fixes titanium mesh is indicated by *arrowhead*.

DISCUSSION

Sometimes, the TiMe is fixated by absorbable sutures (Zhang et al, 2018).[7] But usually, the TiMe is securing with screws which are placed vertically – at the top of the ridge and horizontally as well (Her et al, 2012).[8] Nevertheless, there are some limitations for the bone fixation screws in the case of simultaneous implants placement in that particular maxillary area. They are:

1. Close intraosseous localization of the implants.
2. Neighboring teeth roots localization.
3. Close proximity of the maxillary sinus.

Thus, in those cases another option is possible – to fixate the mesh directly to implant with cover screw (*connecting screw* is used in a ribbed one-tooth-mesh, but plays similar role as cover screw) (Mastakov et al, 2018).[9] And in that case two different types of titanium meshes are available: *1)* ribbed meshes, which are manufactured with special ribs, simplifies mesh`s adaption to the site (ribbed meshes are produced for 1 tooth edentulism), *2)* paper-thick titanium meshes which can be trimmed and adopted in different manner to 1-3 teeth edentulism.

Upon mesh fixation, its` micromovements can be noted. Al-Ardah et al[10] accentuate their attention on the research of Proussaefs et al[11] in which it is suggested that the micromovement of the titanium mesh could induce the formation of pseudoperiosteal layer consisting of connective and granulation tissue. The term 'pseudoperiosteum' was popularized in the study of Boyne et al.[12] So, a surgeon should decide pre-/intraoperatively what amount of fixation screws is enough to achieve mesh stability.

How to manage the most common postoperative complication, an exposure of the titanium mesh is perfectly described in the study of Al-Ardah et al (2017).[10] The main conclusion of their preliminary results – removing the exposed portion of the mesh may result in augmentation similar to clinical cases in which the titanium barrier had not been exposed.[10]

ROLE OF THE CO-AUTHORS

Ivan V. Nagorniak (concept of the paper, material collection, and editing)

Kateryna Yu. Nagorniak (concept and design of the paper, material collection, and writing)

TERM OF CONSENT

Written patient consent was obtained to publish the clinical photographs.

ACKNOWLEDGMENTS

None.

REFERENCES

1. Rasia-dal Polo M, Poli PP, Rancitelli D, Beretta M, Maiorana C. Alveolar ridge reconstruction with titanium meshes: a systematic review of the literature. *Med Oral Patol Oral Cir Bucal* **2014**;19(6):e639–46. https://dx.doi.org/10.4317/medoral.19998.
2. Zita Gomes R, Freixas AP, Han C-H, Bechara S, Tawil I. Alveolar ridge reconstruction with titanium meshes and simultaneous implant placement: a retrospective, multicenter clinical study. *BioMed Res Int* **2016**;1(1):1–12. https://dx.doi.org/10.1155/2016/5126838.
3. Bottino MC, Thomas V, Schmidt G. Vohra YK, Chu TM, Kowolik MJ, Janowski GM. Recent advances in the development of GTR/GBR membranes for periodontal regeneration—a materials perspective. *Dent Mater* **2012**;28(7):703–21. https://dx.doi.org/10.1016/j.dental.2012.04.022.
4. Rakhmatia YD, Ayukawa Y, Furuhashi A, Koyano K. Current barrier membranes: titanium mesh and other membranes for guided bone regeneration in dental applications. *J Prosthodont Res* **2013**;57(1):3–14. https://dx.doi.org/10.1016/j.jpor.2012.12.001.
5. Ricci L, Perrotti V, Ravera L, Scarano A, Piattelli A, Iezzi G. Rehabilitation of deficient alveolar ridges using titanium grids before and simultaneously with implant placement: a systematic review. *J Periodontol* **2013**;84(9):1234–42. https://dx.doi.org/10.1902/jop.2012.120314.
6. Carbonell JM, Martín IS, Santos A, Pujol A, Sanz-Moliner JD, Nart J. High-density polytetrafluoroethylene membranes in guided bone and tissue regeneration procedures: a literature review. *Int J Oral Maxillofac Surg* **2014**;43(1):75–84. https://dx.doi.org/10.1016/j.ijom.2013.05.017.
7. Zhang T, Zhang T, Cai X. The application of a newly designed L-shaped titanium mesh for GBR with simultaneous implant placement in the esthetic zone: a retrospective case series study. *Clin Implant Dent Relat Res* **2019**;1–11. https://dx.doi.org/10.1111/cid.12726.

8. Her S, Kang T, Fien MJ. Titanium mesh as an alternative to a membrane for ridge augmentation. *J Oral Maxillofac Surg* **2012**;70(4):803–10. https://dx.doi.org/10.1016/j.joms.2011.11.017.

9. Mastakov OI, Kondratiuk BR, An AY, Fesenko II. Highly predictable augmentation of the alveolar ridge: using a titanium mesh in two-stage implant surgery at the mandible. Report of clinical cases and surgical technique. *J Diagn Treat Oral Maxillofac Pathol* **2018**;2(1):43–50. https://dx.doi.org/10.23999/j.dtomp.2018.1.4.

10. Al-Ardah AJ, AlHelal A, Proussaefs P, AlBader B, Al Humaidan AA, Lozada J. Managing titanium mesh exposure with partial removal of the exposed site: a case series study. *J Oral Implantol* **2017**;43(6):482–90. https://doi.org/10.1563/aaid-joi-D-17-00169.

11. Proussaefs P, Lozada J. The use of resorbable collagen membrane in conjunction with autogenous bone graft and inorganic bovine mineral for buccal/labial alveolar ridge augmentation: a pilot study. *J Prosthet Dent* **2003**;90(6):530–8.

12. Boyne PJ, Cole MD, Stringer D, Shafqat JP. A technique for osseous restoration of deficient edentulous maxillary ridges. *J Oral Maxillofac Surg* **1985**;43(2):87–91.

Nagorniak IV, Nagorniak KY.
Avoiding risks at the maxilla upon titanium mesh fixation for the guided bone regeneration.
J Diagn Treat Oral Maxillofac Pathol **2019**;3(3):104–9.
http://dx.doi.org/10.23999/j.dtomp.2019.3.3.

http://dx.doi.org/10.23999/j.dtomp.2019.3.4.

Future Events

for 2019-2021

2019

BSCOSO Spring Course 2019
April 14 – 18, 2019
Vilnius, Lithuania
www.bscoso.com

2nd Duesseldorf International Microvascular Flap Course
April 30 – May 04, 2019
Duesseldorf, Germany
Email: *agnes.jedig@med.uni-duesseldorf.de* (Agnes Jedig)

24rd International Conference on Oral and Maxillofacial Surgery (Fig 1)
May 21 – 24, 2019
Rio de Janeiro, Brazil
www.icoms2019.com.br

18th Meeting of the International Society of Craniofacial Surgery
September 16 – 19, 2019
Paris, France
www.iscfs.org

31st World Congress of the International College for Maxillo-Facial-Surgery (ICMFS)
October 29 – November 01, 2019
Tel Aviv, Israel
www.icmfs2019.com

21st International Congress of the Latin American Association of Bucomaxillofacial Surgery and the Mexican Association of Oral and Maxillofacial Surgery
December 01 – December 04, 2019
Cancun, Mexico
www.cialacibu2019.com/en/welcome/

2020

25th Congress of the European Association for Cranio-Maxillo-Facial Surgery
September 15 – 18, 2020
Paris, France
www.eacmfs.org

2021

14th Quadrennial International Facial Nerve Symposium
August, 2021
South Korea
www.internationalfacialnerve.org

FIGURE 1. Screenshot from a website www.icoms2019.com.br.

http://dx.doi.org/10.23999/j.dtomp.2019.3.5.

Submission of Articles

Papers for the Publication

- original papers
- clinical cases (case reports)
- surgical notes
- radiological notes
- reports of new equipment, instruments or technical innovations
- journal or book reviews
- reviews of other journals articles
- letters to the Editor

Article and Abstracts

Article must be written in English.
The authors from the Russian-speaking countries must send an abstract of the article in Russian. The authors from Ukraine must send an abstract of the article in Ukrainian and Russian.
One co-author is denominated as the corresponding author with all contact details:

- Postal address (ZIP code of a country, City, Street, phone and fax number)
- E-mail address

The abstract should include full title of the article, full names and surnames of the co-authors, affiliation, scien¬tific degree, specialty. Also the abstract should include short information about article content: purpose, material and methods, results, conclusions. Example how the Abstract should be looked like the authors can get from the published articles in current issue.

Figures and Tables

Photographs, CT and MRI images, sonograms should be submitted in original with resolution of at least 300 dpi and saved in JPEG or TIFF file format.

Fundings

The authors should indicate the sources of funding that were allocated for the preparation of the article, if such were the case.

Conflicts of Interest

At the end of the article the authors should specify about conflicts of interest (e.g., no conflict of interest).

Role of Co-authors in Writing

After specifying conflicts of interest the role of co-authors in writing of the article (concept and design of the study; material collection, mate¬rial processing, statistical data processing, writing text, editing, etc.) should be designated.

Patient Consent

Written patient consent should be obtained to publish the clinical images of the patients.

Acknowledgments

The authors can acknowledge the persons or institutions which they helped or useful in writing an article.

The Journal is recommended to use that internet source for the articles preparing according to *Vancouver References Style:* http://libguides.murdoch.edu.au/Vancouver/journal

Examples How to Form a Reference List

List all references in numerical order in the text.
Making a list of references from articles, books, internet links, etc.:

Example for the articles:

Fernandes RP, Quimby A, Salman S. Comprehensive reconstruction of mandibular defects with free fibula flaps and endosseous implants. *J Diagn Treat Oral Maxillofac Pathol* **2017**;1(1):6–10.

Example for the articles with more than three authors:

Neto AMR, Monteiro JL, Borba PM, et al. TMJ´s posterolateral dislocation with tympanic plate fracture – case report. *J Diagn Treat Oral Maxillofac Pathol* **2017**;1:59–64.

Example for the articles from the Journal Supplement:
Hammerle CH, Chen ST, Wilson Jr TG. Consensus statements and recommended clinical procedures regarding the placement of implants in extraction sockets. *Int J Oral Maxillofac Implants* **2004**;19(Suppl):26–8.

or

Hammerle CH, Chen ST, Wilson Jr TG. Consensus statements and recommended clinical procedures regarding the placement of implants in extraction sockets. *Int J Oral Maxillofac Implants* **2004**;19:S26–8.

Examples for the book chapters:

Yuen HY, Ahuja AT. Benign clinical conditions in the adjacent neck. In: Sofferman RA, Ahuja AT, editors. Ultrasound of the thyroid and parathyroid glands. Springer, **2012**:229–33.

Example for the books:

Baskin J, Duick D, Levine R. Thyroid ultrasound and ultrasound guided FNA. 2nd ed. New York: Springer; **2008**.

Example for the PhD/ScD work (dissertation for candidate/doctor of science):
Borkowski MM. Infant sleep and feeding: a telephone survey of Hispanic Americans. PhD [dissertation]. Mount Pleasant (MI): Central Micihigan University; **2002**.

Kopchak AV. Clinico-biological and biomechanical study of methods for surgical treatment of mandibular fractures. ScD [dissertation]. Kyiv: Bogomolets National Medical University; **2014**.

Example for references in Cyrillic:

Please indicate the language of writing in square brackets [Ukrainian] or [Russian].
Tymofieiev OO. Manual of maxillofacial and oral surgery [Russian]. 5th ed. Kyiv: Chervona Ruta-Turs; **2012.**
Tymofieiev OO. Diseases of the salivary glands [Ukrainian]. 1st ed. Lviv: VNTL-Klasyka; **2007.**

Examples for the internet links:

Seave A. Elsevier CEO using unique data sets and analytic processes to maintain competitive edge. The Forbes. February 25, 2016. Available at: https://www.forbes.com/sites/avaseave/2016/02/25/elsevier-ceo-using-unique-data-sets-and-analytic-processes-to-maintain-competitive-edge/#1d9e4b3979c2/. Accessed February 25, 2016.

Adult improving access to psychological therapies programme. NHS England. Available from URL:

https://www.england.nhs.uk/mental-health/adults/iapt/ (last accessed 3 March **2017**).

McManus S, Meltzer H, Brugha T, et al., editors. Adult psychiatric morbidity in England, 2007: results of a household survey. The NHS Information Centre for health and social care; 2017. Available from URL: http://www.hscic.gov.uk/catalogue/PUB02931/adul-psyc-morb-reshou-sur-eng-2007-rep.pdf (last accessed 3 March **2017**).

Example for conference paper in print proceedings:

Christensen S, Oppacher F. An analysis of Koza's computational effort statistic for genetic programming. In: Foster JA, Lutton E, Miller J, Ryan C, Tettamanzi AG, editors. Genetic programming: EuroGP 2002: Proceedings of the 5th European Conference on Genetic Programming; 2002 Apr 3-5; Kinsdale, Ireland. Berlin: Springer; **2002**. p. 182-91.

Example for conference paper from the internet:

Cloherty SL, Dokos S, Lovell NH. Qualitative support for the gradient model of cardiac pacemaker heterogeneity. In: Proceedings of the 2005 IEEE Engineering in Medicine and Biology 27 Annual Conference; 2005 Sep 1-4; Shanghai, China. New York: IEEE; **2005** [cited 2010 Sep 2]. p. 133-6. Available from: IEEE Xplore.

Example for A-V materials (DVD):

Acland RD, presenter. Acland's DVD atlas of human anatomy [DVD]. Baltimore (MD): Lippincott Williams & Wilkins; **2004**.

Example for A-V materials (YouTube/Vimeo video):

NRK. Medieval helpdesk with English subtitles [video file]. **2007** Feb 26 [cited 2014 Jan 28]. Available from:http://www.youtube.com/watch?v=pQHX-SjgQvQ

Example for A-V materials (Video recording):

Hillel J, writer. Out of sight out of mind: indigenous people's health in Australia [videorecording]. Bendigo: Video Education Australasia; **2003**.

Example for Readers/Study Guides:

Lynch M. God's signature: DNA profiling, the new gold standard in forensic science. Endeavour. 2003;27(2):93-7. Reprinted In: Forensic Investigation (BIO373) unit reader for forensic DNA component. Murdoch (WA): Murdoch University; **2005**.

Example for newspaper articles in print:

Hatch, B. Smoke lingers for those who keep hospitality flowing. Australian Financial Review. **2006** Jul 13: 14.

Example for newspaper article from the internet:

Devlin, H. Neuron breakthrough offers hope on Alzheimer's and Parkinson's. The Times [newspaper on the Internet]. **2010** Jan 28 [cited 2010 Jan 31]. Available from: http://www.timesonline.co.uk/tol/news/science/medicine/article7005401.ece.

Example for conversation citation:

In a conversation with a colleague from the School of Population Health (Jameson LI **2002**, oral communication, 7th August)...

Example for e-mail citation:

Smith P. New research projects in gastroenterology [online]. E-mail to Matthew Hart (mh@hospital.wa.gov.au) **2000** Feb 5 [cited 2000 Mar 17].

Spelling and Grammar Check

The article should be 'spell checked' and 'grammar checked'. You can use American or British usage, but do not use mixture of them. Authors for whom English is not their native language should add an editing certificate (the international company that can provide editing is: www.enago.com).

Free Access for All Articles

The journal offers the free access to all articles guiding by the main principle of the journal policy, to give a possibility to colleagues from all countries (even from low-income) to use data for the development of specialties related with Oral and Maxillofacial Area.

Editorial of the Journal independently assigns for the articles Index of the Universal Decimal Classification (UDC) according to the requirements of Higher Attestation Commission of Ukraine and Digital Object Identifier (DOI) according to the international standards.

Questions?

i.i.fesenko@dtjournal.org

UKRAINIAN
ASSOCIATION
FOR MAXILLOFACIAL
& ORAL SURGEONS
Founded in 1996

Mission Statement of the Association

We unite, lead, and develop the maxillofacial community to accelerate theoretical and practical movement forward and improve worldwide.

Address and Contacts

4-A Profesora Pidvysotskogo Street,
Kyiv 01103, Ukraine
Tel., fax: +38 (044) 528 35 17.
E-mail: info.uamos@gmail.com
www.uamos.org

March 2019

Officers

Oleksii O. Tymofieiev
(Kyiv, Ukraine)
President

Olena P. Vesova
(Kyiv, Ukraine)
Vice President – Trigemial/Facial Nerve Trauma

Iryna G. Lisova
(Kharkiv, Ukraine)
Vice President – Salivary Glands Diseases/Tumors

Anatolii G. Guliuk
(Odessa, Ukraine)
Vice President – Cleft Surgery

Andrii V. Kopchak
(Kyiv, Ukraine)
Vice President – Jaws Fractures

Natalia O. Ushko
(Kyiv, Ukraine)
Vice President – Graduate Education

Liudmyla M. Iakovenko
(Kyiv, Ukraine)
Vice President – Pediatric Maxillofacial Surgery

Anatolii M. Potapchuk
(Uzhhorod, Ukraine)
Vice President – Postgraduate Education

Volodymyr S. Protsyk
(Kyiv, Ukraine)
Vice President – Head & Neck Oncological Surgery

Kostiantyn Ya. Peredkov
(Kyiv, Ukraine)
Vice President and Secretary-Treasurer

Yan E. Vares
(Lviv, Ukraine)
Vice President – Orthognathic Surgery

Ievgen I. Fesenko
(Kyiv, Ukraine)
Technical Director

Council

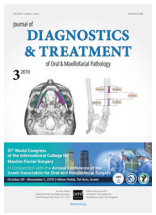
Roman O. Mamonov (Kyiv, Ukraine)
Pavlo I. Tkachenko (Poltava, Ukraine)

International Council

Zurab Chichua (Tbilisi, Georgia)
Chingiz R. Ragimov (Baku, Azerbaijan)
Adnan A. Jezzini (Beirut, Lebanon)
Mazen S. Tammimi (Amman, Jordan)

Disclaimer

The statements and opinions expressed in publications of the *Journal* are solely those of the authors and not of the Ukrainian Association for Maxillofacial and Oral Surgeons (UAMOS). Establishing the integrity of third party resources, such as data repositories located on external websites and servers, used and cited in submissions is the responsibility of the author. All submissions are subject to external peer review as directed by the journal editors, other than UAMOS Statements, which are reviewed by the UAMOS and selected outside experts. The Editors are not permitted to engage in discussions about *Journal* content for forthcoming issues with agencies involved in soliciting advertisements, or companies purchasing advertising space. The UAMOS does not evaluate advertised products or services nor assess advertising claims. Neither the appearance of advertising in publications of the UAMOS, nor reference to a product within the same, constitutes a guarantee or endorsement of the quality or value of such product or of the claims made for it by its manufacturer. Advertisements are randomly placed, and there is no predetermined relationship between the content and the advertisement. The UAMOS reserves the right to decline or refuse advertisements.



*Journal`*s Award in 2018: Evangelos G. Kilipiris, DMD, Visiting Professor

FIGURE. Editor in Chief Oleksii Tymofieiev (*right*) rewards Evangelos Kilipiris, DMD (*left*) with *Journal`*s Award. Kyiv, Ukraine; May, 2018.

You can change the world.
—Tim Cook
CEO of Apple, Inc

Evangelos G. Kilipiris, DMD, Visiting Professor (Fig) is permanently changing and improving the world of maxillofacial surgery around the globe. And he has such a beautiful gift to inspire others to unlock their potential.

With his strong vision for the better future, great kindness, and enormous generosity he has a unique ability to connect people of different continents: South America and Europe, Asia and North America, etc. And with those wonderful skills the impact of Dr. Kilipiris in the supporting a *Journal* cannot be measured… The cutting-edge articles and reviews,[1-4] a hard work in position of Director of the *Journal`*s Development Department, and, of course, huge amount of so needed lectures are done by him without having any breaks.

So, it`s a greatest pleasure for the whole *Journal`*s staff to present honorary plaque to Dr. Kilipiris with a humble words: *"To a role model with an incredible leadership skills, for the uniting of maxillofacial communities of Slovak Republic, Greece and Ukraine sincere thanks and appreciation."*

Ievgen I. Fesenko, Managing Editor
Kyiv, Ukraine
i.i.fesenko@dtjournal.org

http://dx.doi.org/10.23999/j.dtomp.2019.3.6.

References

1. **Kilipiris EG**, Horn F, Petrik M, Kabat M, Trnka J, Stanko P. Surgical correction of craniosynostosis. A single institution`s outcome analysis of 70 patients. *J Diagn Treat Oral Maxillofac Pathol* **2017**;1(3-4):137–46. https://dx.doi.org/10.23999/j.dtomp.2017.3.5.
2. **Kilipiris EG**. Review of event. 24th Congress of the European Association for Cranio-Maxillo-Facial Surgery (EACMFS2018): 18-21 September 2018–Munich–Germany. *J Diagn Treat Oral Maxillofac Pathol* **2018**;2(3):A9.
3. **Kilipiris EG**, Machalekova K, Fountoulaki G, Andrade K, Mantziaris N, Stanko P. Correlation and accuracy of labial minor salivary gland biopsy in the establishment of diagnosis in patients with suspected Sjögren's syndrome. *J Diagn Treat Oral Maxillofac Pathol* **2018**;2(3):122–31. https://dx.doi.org/10.23999/j.dtomp.2018.3.5.
4. **Kilipiris EG**, Pavlik S, Horn F, Kabat M. Three-dimensional computed tomography imaging in the evaluation of the child with craniosynostosis: study of 60 patients. *J Diagn Treat Oral Maxillofac Pathol* **2019**;3(2):52–75. https://dx.doi.org/10.23999/j.dtomp.2019.2.3.

TANTUM VERDE®

QUICK RELIEF FROM PAIN AND INFLAMMATION IN THE MOUTH AND THROAT[1]

AN INTEGRAL COMPONENT OF THE TREATMENT OF PAIN AND INFLAMMATION IN THE ORAL CAVITY IN 60 COUNTRIES WORLDWIDE![2]

- **JAWS FRACTURES[3]**
- **IMPLANTS PLACEMENT[4]**
- **WOUNDS OF ORAL CAVITY[5]**

Reg. № UA/3920/01/01

LOCAL ANESTHETIC AND ANTI-INFLAMMATORY EFFECT[1]

SUMMARY OF PRODUCT CHARACTERISTICS

NAME OF THE MEDICINAL PRODUCT. Tantum Verde 0.15% mouthwash. QUALITATIVE AND QUANTITATIVE COMPOSITION. Each 100 ml contains: active ingredient: benzydamine hydrochloride 0.15 g (equivalent to 0.134 g of benzydamine). **Therapeutic indications.** Treatment of symptoms such as irritation/inflammation including those associated with pain in the oropharyngeal cavity (e.g. gingivitis, stomatitis and pharyngitis), including those resulting from conservative or extractive dental therapy. **Posology and method of administration.** Pour 15 ml of Tantum Verde mouthwash into the measuring cup, 2-3 times per day, using it either at full concentration or diluted. If diluted, add 15 ml of water to the graduated cup. Do not exceed the recommended dosage. **Contraindications.** Hypersensitivity to benzydamine or to any of the excipient. **PHARMACOLOGICAL PROPERTIES. Pharmacodynamic properties.** Pharmacotherapeutic group: Stomatologic drugs: other agents for local oral treatment, ATC code: A01AD02. Clinical studies demonstrate that benzydamine is effective in relieving suffering from localised irritation of the mouth and pharynx. In addition, benzydamine possesses a moderate local anaesthetic effect. **Pharmacokinetic properties.** Absorption. Absorption through the oropharyngeal mucosa is demonstrated by the presence of measurable quantities of benzydamine in human plasma. These levels are insufficient to produce systemic effects. Distribution. When applied locally, benzydamine has been shown to accumulate in inflamed tissues where it reaches effective concentrations because of its capacity to penetrate the epithelial lining.

Information about medicines. Information for health care professionals for use in professional activities.

1. Інструкція для медичного застосування лікарського засобу Тантум Верде®, розчин для ротової порожнини, РП № UA/3920/01/01, затверджено Наказом Міністерства охорони здоров'я України № 636 від 01.10.2015.
2. http://www.angelinipharma.com/wps/wcm/connect/com/home/Angelini+Pharma+in+the+world/
3. Тимофеев А.А. и др. "Особенности гигиены полости рта для профилактики воспалительных осложнений при переломах нижней челюсти". Современная стоматология 2015;1(75):52–8.
4. 4,5. Tymofieiev O.O. et al"Prevention of inflammatory complications upon surgeries in maxillofacial region". J Diagn Treat Oral Maxillofac Pathol. 2017;1:105–12.

Clinical and CT images are courtesy of: Ievgen Fesenko (Department of Oral & Maxillofacial Surgery, PHEI "Kyiv Medical University", Kyiv, Ukraine), Oleg Mastakov ("SCIEDECE—Scientific Center of Dentistry & Ultrasound Surgery" Kyiv, Ukraine)

ANGELINI

04119, Kiev, Melnikova str. 83D, of. 404.
Tel.: (044) 538-01-26
Fax: (044) 538-01-27

Dileo FARMA