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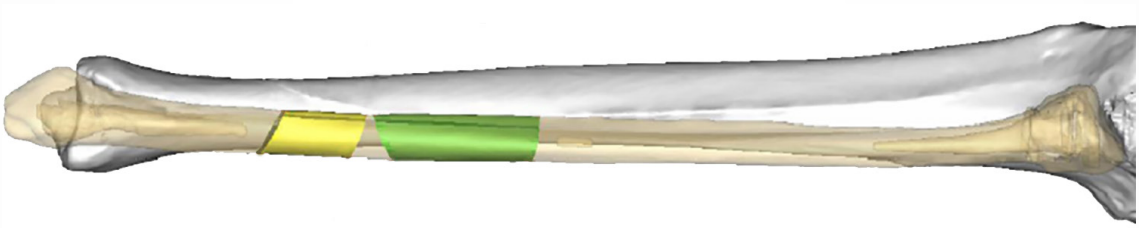

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Official Journal of the
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TANTUM VERDE®

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

About the Journal: Aims and Scope

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Official Title

Journal of Diagnostics and Treatment of Oral and Maxillofacial Pathology

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J. Diagn. Treat. Oral Maxillofac. Pathol.

Acronym

JDTOMP

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Aims & Scope

This is a monthly peer-reviewed oral and maxillofacial surgery journal focused on: microvascular and jaw reconstructive surgery, dental implants, salivary gland tumors/diseases, TMJ lesions, virtual surgical planning, implementation of ultrasonography into the practice of oral and maxillofacial surgeons.

Editorial Board (EB) Composition

- EB shows significant geographic diversity representing 30 opinion leaders from 13 countries: Brazil, Canada, Colombia, Greece, Hong Kong (SAR, China), India, Israel, Italy, Slovak Republic, Spain, Ukraine, United Arab Emirates, and United States.
- The majority of the EB Members have a discernible publication history in Scopus, Web of Science, and journals with a high impact factor.
- The publication records of all EB members are consistent with the stated scope and published content of the journal.
- The journal has a several full-time professional editors.
- Gender distribution of the editors: 10% women, 90% men, 0% non-binary/other, and 0% prefer not to disclose.

Frequency

12 issues a year (from January 2020)

Publication History

2017: 4 issues a year
2018: 4 issues a year
2019: 10 issues a year
From 2020: 12 issues a year

Publishing Model

Journal of Diagnostics and Treatment of Oral and Maxillofacial Pathology is a fully online-only open access and peer-reviewed publication.

Type of Peer Review

The journal employs "double blind" reviewing.

Article Publishing Charge (APC)

The APC in this journal is US $500 and US $250 (excluding taxes) depending on the article`s type. Details at website: dtjournal.org.

13 Types of Articles Currently Published by the Journal

Editorials/Guest Editorials/Post Scriptum Editorials, Images, Case Reports/Case Series, Original Articles, Review Articles, Discussions, Paper Scans (*synonyms*: Review of Articles, Literature Scan), Book Scans (*synonym*: Book Reviews), Letters to the Editor (*synonym*: Letters), and Viewpoints.

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Official Journal of the Association

Ukrainian Association for Maxillofacial and Oral Surgeons

Ukrainian Association for Maxillofacial and Oral Surgeons (UAMOS)

Address: 4-A Profesora Pidvysotskoho Street, Kyiv 01103, Ukraine.
Tel., fax: +38 044 528 35 17.
Website: uamos.org.

Editorial Board

NOVEMBER 2022 • VOLUME 6 • ISSUE 11
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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.

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Order of the

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FIGURE. Evangelos G. Kilipiris, MD, DMD from the National Institute of Children's Diseases and Faculty of Medicine at Comenius University, Bratislava, Slovak Republic. A kind support of Dr. Kilipiris during the 5 years at the position of Director, Journal Development Department helped our journal to move forward and to evolve. An honorary plaque was presented to him on behalf of the Chief Editor with words "To a Founding Director, Author of Multiple Articles and Reviews, Great Thanks and Appreciation." Photo was taken on November 23, 2021.

Content

of the Volume 6 • Issue 11 • November 2022

COURTESY

Journal`s cover image (virtual surgical planning for a segmental mandibular reconstruction with fibula transplant) is courtesy of Rui P. Fernandes, MD, DMD, FACS, FRCS.

Image was taken from the article: 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.

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BUSINESS: EDITORIAL

Ivan V. Nagorniak, MSc, PhD, *Section Editor*

Power Blackouts and Organization of Uninterrupted Performance of Surgical Procedures in Private Practice

Ivan V. Nagorniak

The Ukrainian energy system is subject to new attacks. That is why the government is preparing for all possible scenarios of the development of events. We are activating the import of energy generating means. Every Ukrainian can import a generator or a charging station from abroad without paying customs duties and VAT.[1]

—Denys Shmyhal
Prime Minister of Ukraine

November 21, 2022, day 271 of a full-scale Russian military invasion into Ukraine.[2] Russia, having suffered a defeat on the battlefield (including recent Ukraine's retaking of Kherson),[3] as a terrorist state,[4] switched to the tactics of shelling the objects of the critical energy structure of Ukraine. These attacks by cruise missiles and kamikaze drones lead to numerous daily emergency and planned power outages in populated areas of Ukraine, and particularly in Kyiv.[5–7]

Small businesses in Kyiv are adapting and mass buying and switching to gasoline generator sets (Fig 1A, B). According to the Cabinet of Ministers of Ukraine as of November 21, 2022, about 8,500 generator sets are imported per day.[1]

Private dental practices are no exception, and in order to provide uninterrupted patient care and stable business operation incur such costs as investing in generator set of their own. Clinics that perform long surgical procedures (e.g., wisdom teeth removal, sinus lifts, alveolar bone augmentation, dental implants placement, etc.) need such generator sets especially.

Although for the small coffee shops a 5-kW generator sets (Fig 1B) is sufficient, a 10-kW gasoline generator set (like GM Daewoo, GDKM13500E, Bupyeong, South Korea) for the uninterrupted work of private practice is a preferred one (Fig 1C).[8] It has an increased to 30 liters capacity of the fuel tank, working time up to 20 hours, electric and manual start.[7] Its price on the Ukrainian internet market is within 132,200 UAH (i.e., $3,595 USD).[8] The sellers also offer installment plan for such type of generator sets. This amount can be paid in installments of 3, 6 or 10 payments[8] what makes

MSc, PhD; Head Doctor, Individual Entrepreneur Nagorniak I.V., Kyiv, Ukraine.

Author's address: Private Practice (Certificate for management system according to ISO 9001:2015 – Private Entrepreneur Nagorniak I.V.), 6-G Andriushchenka Street, Office 6, Kyiv 01135, Ukraine.
E-mail: *ivan.nagorniak@gmail.com*

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FIGURE 1. Gasoline generator sets.

such purchase a much more affordable for the practice owners. Moreover, it's a great luck that Ukrainian market as of 2022 offers such a huge number of generators set models.

Thus, rethinking this wartime situation and the forced urgent investment in a gasoline generator set, you can look at it as follows. You can consider the urgent purchase of a generator, as well as the purchase of a dental chair, a set of surgical instruments, an orthopantomograph, a cone-beam computer tomograph, etc. by the clinic. Compared to investments in other equipment, a gasoline generator set is not such an expensive purchase. At the same time, it will allow you to make your private practice as autonomous as possible even when the lights are turned off, even in peacetime or during natural disasters. Such a step will ensure the uninterrupted operation of the institution of your dreams and will further increase the reputation of your institution in the eyes of patients, employees, and colleagues.

And although there are fewer blackouts now, I want everyone to understand: most likely, Ukrainians will have to live in blackouts until at least the end of March [2023].[9]

—Serhiy Kovalenko
CEO, YASNO Energy Resource Supplier

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CASE

Schwannoma of the Tongue: Ultrasonography

Valentyn H. Demidov[a], Olha S. Cherniak[b,*], Pavlo P. Snisarevskyi[c], Valentyna I. Zaritska[d], & Klavdiia M. Shatrova[e]

SUMMARY

Schwannoma is a rare benign tumor originated from the Schwann cells of the nerve sheath. Other common names are neurilemmoma, neurinoma, and neurinoma of Verocay. The tumor is encapsulated and shows slow growth reaching even the 8.5-cm size. The purpose of this paper is to provide clinical presentation, sonogram and ultrasound video of schwannoma of the tongue, its analysis along with intraoperative and histopathological data. A 27-year-old female patient with tongue schwannoma is presented and analysis of the published schwannoma cases in different anatomical areas is performed. Distinctive sonographic features of this type of tumor are showed and comparison with the other tongue masses is highlighted. Ultrasonography proved its efficacy as a first-line diagnostic tool which needs to be popularized among oral and maxillofacial surgeons.

Kyiv, Ukraine

[a] Doctor-Stomatologist-Surgeon (DSS), Center of Maxillofacial Surgery and Dentistry, Public (Communal) Non-profit Enterprise of the Kyiv Region Council "Kyiv Regional Clinical Hospital."

[b] Doctor of Ultrasound Diagnostics (DUD), Head, Department of Ultrasound, Regional Diagnostic Center, Polyclinic, Public (Communal) Non-profit Enterprise of the Kyiv Region Council "Kyiv Regional Clinical Hospital."

[c] Doctor-Pathologist (DP), PhD, Head, Department of Pathomorphology, Public (Communal) Non-profit Enterprise of the Kyiv Region Council "Kyiv Regional Clinical Hospital."

[d] Doctor-Pathologist (DP), PhD, Associate Professor, Department of Pathological and Topographical Anatomy, Shupyk National Healthcare University of Ukraine.

[e] Doctor-Pathologist (DP), PhD, Associate Professor, Department of Pathological and Topographical Anatomy, Shupyk National Healthcare University of Ukraine.

* Corresponding author's address: Office 418, Polyclinic, Kyiv Regional Clinical Hospital, 1 Bahhovutivska Street, Kyiv 04107, Ukraine.
E-mail: *cherniak.os@gmail.com* (Olha Cherniak)
ORCID: https://orcid.org/0000-0002-6372-0043

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Word 'Video' at the upper right icon means that article contains supplemental video content.

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INTRODUCTION

Schwannoma is a rare benign tumor originated from the Schwann cells of the nerve sheath.[1,2] Other common names are *neurinoma*[2], *neurinoma of Verocay*,[3] and *neurilemmoma*[3]. The tumor is encapsulated and shows slow growth reaching even 8- or 8.5-cm size.[2,4]

In contrast to other studies, which demonstrate data from magnetic resonance imaging (MRI) examination[1,5,6] in schwannomas and a limited number of ultrasound (US) images[6], the purpose of this article is to provide video imaging of schwannoma of the tongue, its analysis along with clinical, intraoperative, and histopathological data.

CASE

A 27-year-old female patient presented to the Center of Maxillofacial Surgery and Dentistry in 2016 with tongue asymmetry due to the expansive lesion (Fig 1). The lesion had been growing insidiously for last several years. Tongue examination revealed a firm, soft, lobulated mass on the right tongue, painless upon palpation. Overlying mucosa was slightly erythematous. Real-time gray scale and color Doppler US with its interpretation has been done by O.S.C. (her experience in head and neck US is 16 years).

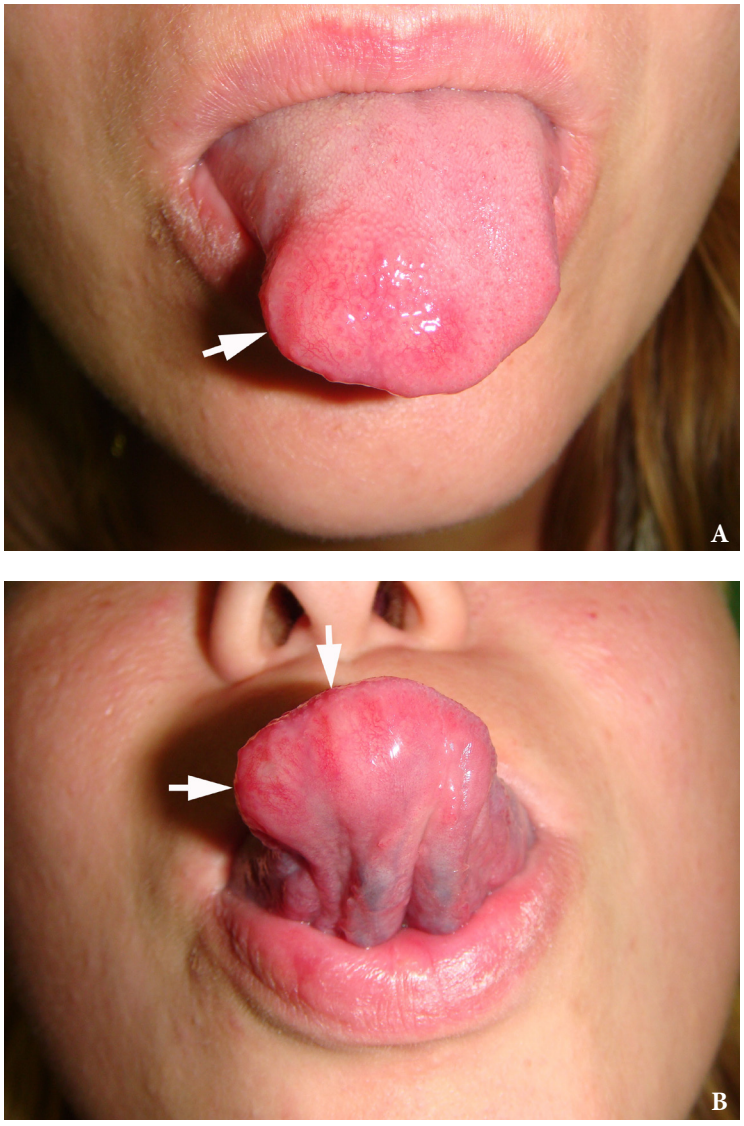


FIGURE 1. Preoperative view (**A**, **B**) of a 27-year-old female patient with tongue asymmetry due to the expansive lobulated lesion (*arrows*). Printed with permission and copyrights retained by V.H.D.

US was performed with the patient in the supine position, sticking out the tongue, and using an Esaote MyLabTM Seven machine (Esaote S.p.A, Genoa, Italy) and a 3- to 19-MHz linear array transducer, wrapped in a plastic film. The patient was informed that the gel (ECO SUPERGEL, Ceracarta S.p.A., Forlì, Italy) used for US diagnostics is nontoxic. Gray-scale US (Fig 2) of the right tongue showed bilobed well-defined hypoechoic and slightly heterogeneous lesion (with dense echoic graininess). The lesion was hypoechoic relative to adjacent tongue muscles and weakly compressible. Long-to-short diameter of the

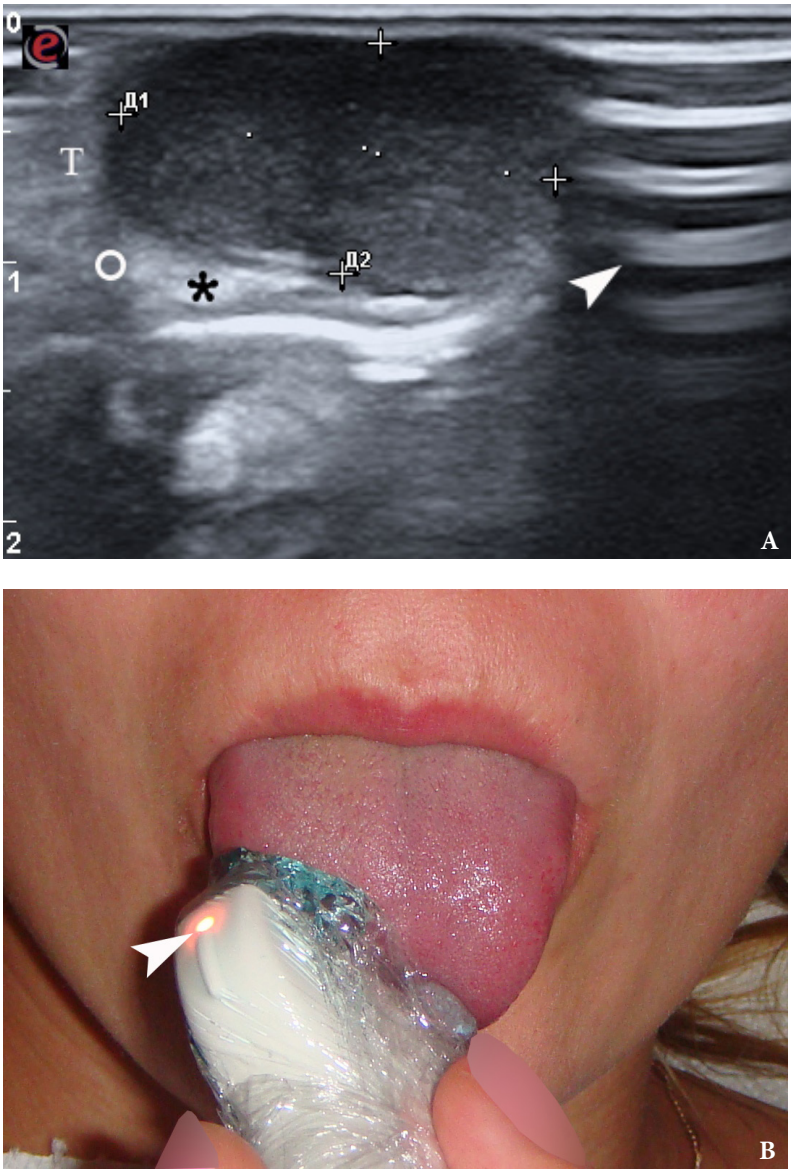
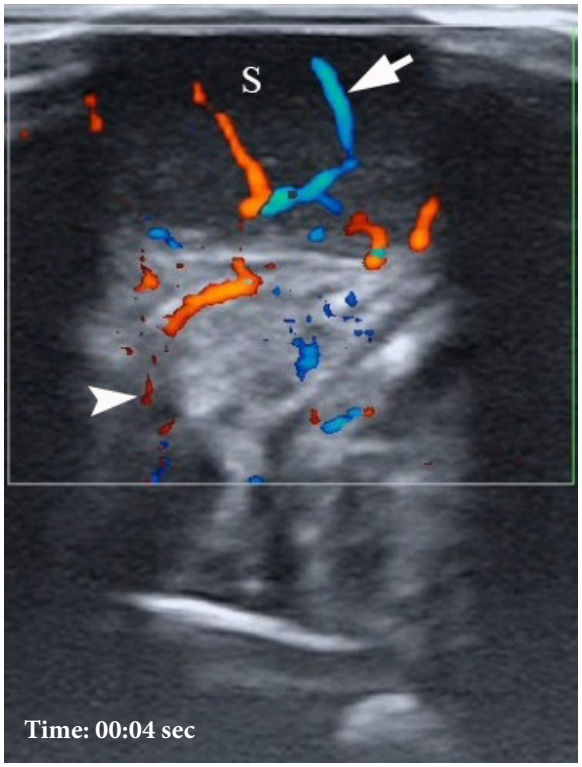


FIGURE 2. Gray-scale ultrasound (**A**) of the right tongue shows lobulated well-defined hypoechoic and slightly heterogeneous lesion (with dense echoic graininess). The lesion is hypoechoic relative to adjacent tongue (T) muscles and is weakly compressible. Long-to-short diameter of the lesion measured 1.69 × 0.9 cm (long diameter is indicated by Cyrillic letter with number (Д1) and two '+' calipers in a horizontal direction; short diameter is indicated by Cyrillic letter with number (Д2) and two '+' calipers in a vertical direction). The artifact of acoustic enhancement (*asterisk*) behind the lesion, edge artifact (*circle*), and reverberation lines (i.e., the reverberation artifact) (*arrowhead*) are visualized on the sonogram. No anechoic areas typical for cystic areas are visualized. Absence of the parallel echoic streaks typical for the majority of lipomas, presence of acoustic enhancement, and weak compressibility make this US appearance uncommon for the lipomas.[7,8] The "depth" of cropped gray-scale sonogram is 2.0 cm. Red letter "e" at the upper left corner of the sonogram indicates on the probe's side (corresponds to the probe bump and light [*arrowhead*]). **B**, position of the probe upon ultrasonography. Printed with permission and copyrights retained by O.S.C.

lesion measured 1.69 × 0.9 cm. The artifact of acoustic enhancement behind the lesion, edge artifact, and reverberation lines (i.e., the reverberation artifact) are visualized on the sonogram. No anechoic areas typical for cystic areas are visualized. Absence of the parallel echoic streaks typical for the majority of lipomas, presence of acoustic enhancement, and weak compressibility made this US appearance uncommon for the lipomas.[7,8] Video (Supplemental Video Content) demonstrates color Doppler US of the right side of the tongue's body. Tumor visualized as a heterogeneously hypoechoic mass. The prominent intratumoral vascularization and vascular motion artifact were noted. Video is available in the page of the full-text article on www.dtjournal.org and in the YouTube channel, available at https://youtube.com/shorts/qFO18Mnd-pQ?feature=share. Total video's duration is 22 seconds. Surgical excision included a



VIDEO. A 27-year-old female patient. Supplemental Video Content demonstrates color Doppler ultrasound of the schwannoma (S) of the tongue. The tumor is visualized as a heterogeneously hypoechoic mass. The intratumoral vascularization (*arrow*) and vascular motion artifact (*arrowhead*) are noted. The "depth" of cropped US image is 3.0 cm. Video is available in the page of the full-text article on www.dtjournal.org and in the YouTube channel, available at https://youtube.com/shorts/qFO18Mnd-pQ?feature=share.

Total video's duration: 22 seconds. This video is a repeated ten-second recording of color Doppler ultrasound that is repeated for better visualization.

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margin of adjacent tissue and was performed under the general anesthesia. Specimen (Fig 3) visualized as a resected part of the tongue with a bilobed (dumbbell-shaped) yellow-white tumor inside. The tumor had well-circumscribed margins and was slightly tender on palpation. Macroscopically, the color of tumor mimicked lipoma. Figure 4 compares the tumor's appearance on gray scale sonogram and macroscopically. The patient experienced no neurological disorder postoperatively.

Schwannoma was established as histopathological diagnosis (Fig 5) by three experienced doctor-pathologists (P.P.S., his experience is 18 years; V.I.Z., her experience is 23 years; K.M.S., her experience is 48 years). No recurrence has been observed in a 2-year follow-up period.

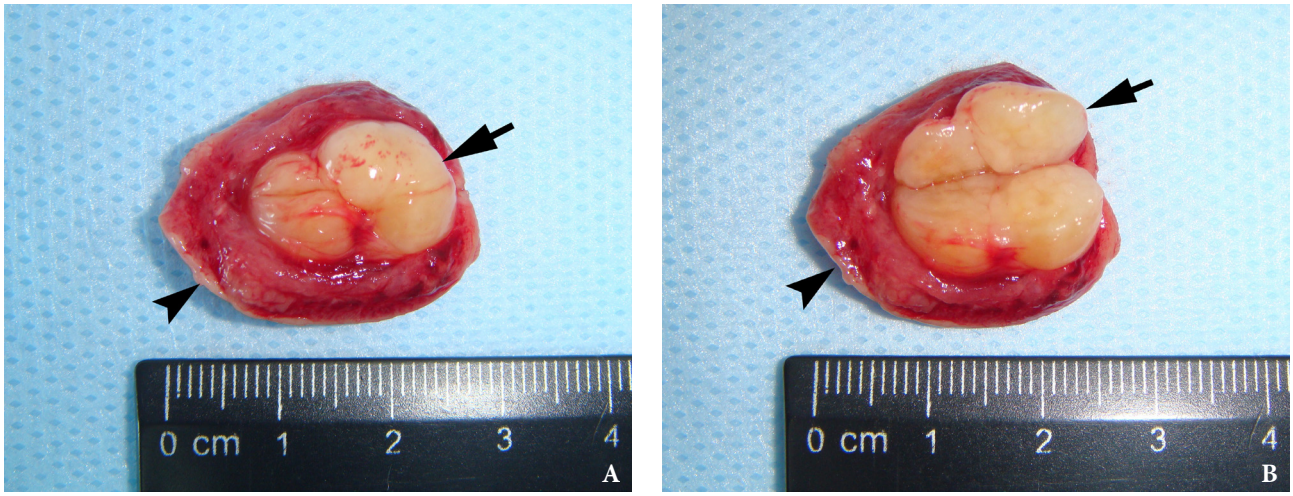

FIGURE 3. Macroscopic view of the specimen before (**A**) and after (**B**) the incision of the bilobed intramuscular tumor. Notes the resected part of the tongue (*arrowhead*) and yellow-white tumor (*arrow*) inside. The tumor had well-circumscribed margins and was slightly tender on palpation. Macroscopically, the color of this schwannoma mimicking lipoma.

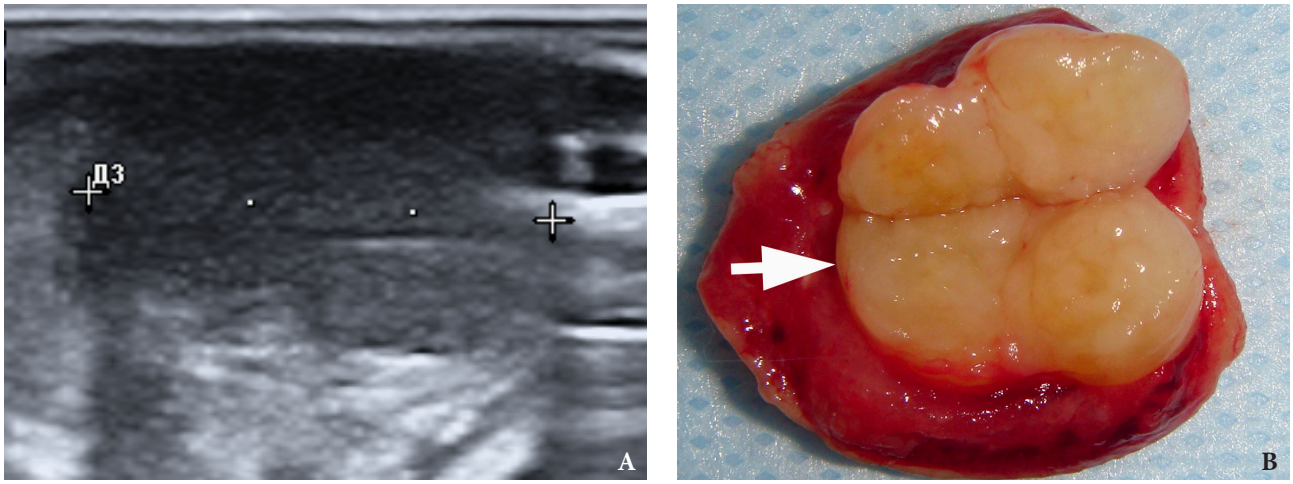

FIGURE 4. Comparison of the tumor's appearance on gray scale sonogram (**A**, schwannoma is a heterogeneously hypoechoic mass between '+' calipers) and macroscopically (**B**, *arrow* labels schwannoma).

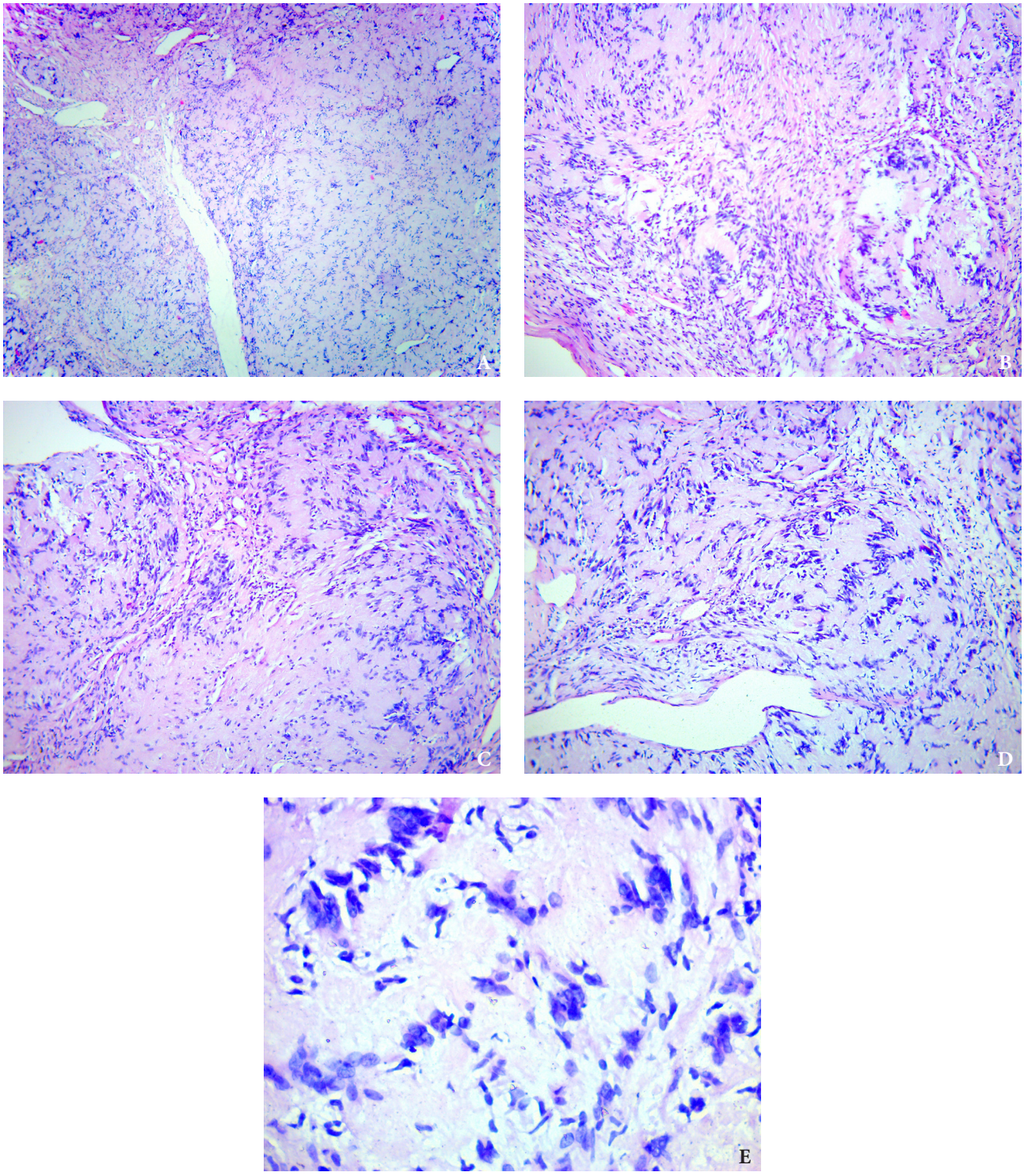

FIGURE 5. Microscopic view of the presented schwannoma of the tongue. Fibrous structures are grouped into bundles that are placed randomly or in some places form formations with "swirls" and numerous correctly oriented cells that form palisade and pseudopalisade-like structures (Verocay bodies). Hematoxylin and eosin stain. Magnification: **A**, ×40; **B**–**D**, ×100; **E**, ×400.

DISCUSSION

According to Kang et al (2007), neurilemmomas (i.e., schwannomas) may originate from any peripheral, cranial or autonomic nerves of the body (except of the olfactory and the optic nerves).[9] Schwannomas reported in pancreas[10], kidneys[11], hands[12], thumbs[13], floor of the mouth[14,15], soft palate[16], maxillary alveolus[17], tongue[4,18–19], etc. Pfeifle et al (2021) indicate that total of 25 percent of neurilemmomas occur in the head and neck area, but only 1 percent are intraorally located.[20]

Analysis performed by Kavčič and Božič (2016) revealed that schwannomas in tongue are noted in one of two locations—base (one-third of cases) and oral part (two-thirds of cases).[21]

The analysis of the sonographic appearances of other tongue masses is well described in the literature.[6] Konishi et al (2020) showed how huge the potential of tongue ultrasonography is, presenting the US examination of patients with primary tongue cancer.[22] Sugawara et al (2016) depicted the US appearance of different pathologies involving tongue—fibrous polyp, cavernous haemangioma, pyogenic granuloma, lipoma, liposarcoma, chondroma, lymphangioma, schwannoma, solitary neurofibroma, pleomorphic adenoma, and amyloidosis.[6]

The case of schwannoma presented by Sugawara et al (2016) highlighted MRI, B-mode and power Doppler US, and histopathological features of the tumor in a 16-year-old male.[6] Gray-scale US in their case showed an elliptical mass with a well-defined border and a comparatively homogeneous echo texture with posterior acoustic enhancement.[6] Power Doppler showed motion artifacts and did not allow to evaluate the tumor vascularity.[6] In our case, despite the motion artifacts, a prominent intratumoral vascularity was noted.

Kang et al (2007) performed retrospective analysis of twenty one head and neck schwannomas managed in a single institution. Their study showed one case of the US appearance of the schwannoma.[9] It was an accessory nerve schwannoma with a supraclavicular location which was visualized on gray-scale US as non-vascular well-defined cystic lesion containing dependant debris.[9]

Cases presented in the reports of Pfeifle et al (2001)[20] and Kavčič and Božič (2016)[22], comparing with our case, demonstrate similar clinical presentation of the tongue schwannoma.

Describing the US features of the schwannoma, in our case we should apply the US features/criteria of the Ahuja et al (1998) for the differential diagnosis with head and neck lipomas.[7] (1) Echogenicity, (2) shape and size, (3) internal architecture, (4) border, (5) distal enhancement, (6) compressibility, and (7) color flow are those features/criteria.[7]

Elliptical (88 percent) and ovoid (12 percent) shape is typical for lipomas[7], but in our case the shape was lobulated. The fundamental sonographic study of Zhong et al (2004) showed that in 90 percent of cases the lipomas are hypoechoic with either echogenic spots or lines, and in 10 percent lipomas are either isoechoic or hyperechoic.[8] So, according to Zhong et al (2004) and Ahuja et al (1998) sonographic appearance of lipomas is with echogenic spots/lines noted from 90 to 100 percent of cases.[8,7] In our report, the tumor was hypoechoic, what corresponds to only 16 percent[7] of lipomas. Clearly sonographically identified capsule of lipomas is noted in 88 percent of cases.[7] Typically, none of the investigated lipomas showed an artifact of posterior enhancement or attenuation[7], but the presented tumor showed prominent acoustic enhancement. All lipomas are compressible with moderate probe pressure.[7] Usually, head and neck lipomas showed no internal vascularity[7], and in our case the prominent intratumoral vascularity and a vascular motion artifact was noted. Recognition of a vascular motion artifact and artifact of acoustic enhancement is important, as its understanding will help in US examination of the tissues and tumor's structure thus facilitating the differential diagnostics (Hindi et al, 2013).[23]

In summary, among all seven US features/criteria (Ahuja et al, 1998), the tumor in our case was positive only in one feature (hypoechoic echogenicity).[7]

The profound review of the publications dedicated to tongue neurilemmomas published from 1955 to 2016 was performed by Lee et al (2017).[12]

In our opinion, it is not correct to draw conclusions based on US patterns of schwannoma only in the area of the tongue, but it is worth knowing the options of US pictures of schwannoma in other anatomical areas. This will make possible understanding the entire palette of possible US patterns for schwannoma, which in turn will facilitate

differential diagnosis and increase the accuracy of establishing a preoperative diagnosis and choosing the most appropriate treatment tactics.

Summarizing sonographic appearances of the schwannoma in different anatomical locations worth to note that possible US patterns are solid[6,24,25], cystic[9,12,26], and mixed[27,28]. Reynolds et al (2003) presented the US results more than worth of attention.[24] Their team made sonographic comparison of two types of peripheral nerve sheath tumors—schwannomas and neurofibromas.[24] In 83 percent the schwannomas were hypoechoic, 67 percent of schwannomas were homogeneous, 67 percent of neurilemmomas showed artifact of posterior acoustic enhancement, and 67 percent of neurilemmomas were centrally related to the involved peripheral nerve.[24]

Increased flow on color Doppler US can be noted in the schwannoma cases (Beggs,[29] 1999; Reynolds et al,[24] 2003). These data are supported by our case.

Unlike schwannomas of the tongue, schwannomas of the neck are characterized by thickening of the adjacent nerve.[30] In 2012, Ahuja and Yuen indicated that despite some differences, US cannot reliably distinguish schwannomas of the neck from neurofibromas.[28] However, even mild probe's pressure obliterates schwannoma's vascularity, what indicates that neurilemmomas vascularity is very sensitive to pressure.[30]

Shrikrishna et al (2016) published case series which included vagal schwannoma, axillary nerve schwannoma, and cervical sympathetic chain schwannoma.[31] In their article, the preoperative view, computed tomography, intraoperative view, and histopathology are presented, allowing to compare schwannomas derived from different nerves in different locations.[31]

Harazano et al (2022) presented retrospective histopathological analysis of forty schwannomas localized in the oral and maxillofacial region.[32] Among the anatomical areas of the schwannoma cases presented in their study were—tongue (45 percent), lower lip (17.5 percent), hard palate (10 percent), parotid gland (5 percent), buccal mucosa (7.5 percent), mandible (7.5 percent)[33], floor of the mouth (2.5 percent), maxilla (2.5 percent), and cheek (2.5 percent).[32]

The existed and described histopathological variants are: two main patterns (Antoni A and B) (i.e., classic schwannoma) and multiple subtypes—ancient, plexiform, cellular, and epithelioid.[32] Ancient (i.e., degenerative) neurilemmomas are uncommon in oral and maxillofacial area.[32] It's important to know that schwannomas can have pathological characteristics of both main patterns and ancient changes or can show no evidence of Antoni A and B patterns and degenerative subtype.[32] In general, the authors categorized histopathological combinations into 8 variants.[32]

Our case supports the thesis of Winter et al (2020) who emphasized that US is a well-established, non-invasive, and easily repeatable first-line tool in diagnostics of soft tissue tumors.[34]

CONCLUSIONS

Our report demonstrated unique clinical images, sonograms and ultrasound video of schwannoma of the tongue which is macroscopically presented as a bilobed solid well-circumscribed tumor. More ultrasound descriptions of tongue schwannoma cases are needed to create a wider picture of possible echo-patterns of this type of tumors in a tongue organ.

TERM OF CONSENT

Writing patient's consent was obtained for publication the photos.

AUTHOR CONTRIBUTIONS

Conceptualization: Demidov VH, Cherniak OS. Ultrasonographic data acquisition: Cherniak OS. Surgical images acquisition: Demidov VH. Histological data acquisition: Zaritska VI, Snisarevskyi PP. Data analysis or interpretation: Cherniak OS, Zaritska VI, Shatrova KM. Drafting of the manuscript: Cherniak OS. Critical revision of the manuscript: Cherniak OS, Demidov VH, Zaritska VI, Snisarevskyi PP. Approval of the final version of the manuscript: all authors.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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