

ORL

Volumen 16 • Número 2 • 2025

OTORRINOLARINGOLOGÍA
DOCUMENTACIÓN Y METODOLOGÍA DE INVESTIGACIÓN



eISSN: 2444-7986
DOI: <https://doi.org/10.14201/orl.2025162>
<https://revistas.usal.es/index.php/2444-7986/>



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Salamanca

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INTELIGENCIA ARTIFICIAL EN LA REVISIÓN POR PARES: ¿ACELERACIÓN SIN PERDER INTEGRIDAD CIENTÍFICA?

Artificial Intelligence in Peer Review: Acceleration Without Losing Scientific Integrity?

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Fecha de publicación: 27 de abril de 2025

Fecha de publicación del fascículo: 27 de junio de 2025

Conflicto de intereses: Los autores declaran no tener conflictos de intereses

Imágenes: Los autores declaran haber obtenido las imágenes con el permiso de los pacientes

Política de derechos y autoarchivo: se permite el autoarchivo de la versión post-print (SHERPA/RoMEO)

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INTRODUCCIÓN

La revisión por pares es el pilar fundamental del control de calidad de las publicaciones en la ciencia y en la medicina. El proceso enfrenta desafíos crecientes—volumenes de manuscritos en ascenso, escasez de revisores y riesgos de parcialidad—que amenazan su sostenibilidad. En este contexto, la inteligencia artificial (IA) ha irrumpido como una herramienta con potencial para transformar cada etapa del proceso editorial. Explorar el alcance real, las fortalezas, limitaciones y los riesgos ético-legales de la IA en la revisión por pares es hoy

una cuestión estratégica para la integridad de la literatura científica.

REVISIÓN

Un análisis de la literatura asistida con UnderMind revela que la IA ya actúa en múltiples fases del flujo editorial: desde el cribado inicial y la asignación de revisores hasta la generación de informes y cartas de decisión [1-5]. Herramientas como Statcheck, Penelope.ai, y modelos de lenguaje (por ejemplo, GPT-4) agilizan la detección de plagio, verifican el formato y resumen contenidos, mientras

que algoritmos basados en aprendizaje profundo expanden y diversifican la selección de expertos revisores [1, 3, 4, 9, 10]. Los estudios muestran una reducción significativa en los tiempos de revisión y una mejora en la detección de errores formales [9, 10]. Asimismo, la IA permite identificar revisores fuera de las redes tradicionales, aumentando la diversidad [10]. Sin embargo, la evidencia alerta sobre nuevos riesgos: comentarios superficiales o irrelevantes, generación de referencias ficticias, reproducción de sesgos presentes en los datos de entrenamiento y problemas potenciales de privacidad o confidencialidad al usar sistemas comerciales [1, 4, 5, 7]. A pesar del optimismo sobre la eficiencia, existe consenso en que la intervención humana sigue siendo indispensable para detectar limitaciones de contexto, argumentar críticamente y validar las decisiones (*human-in-the-loop*) [1, 3, 5, 10]. Paralelamente, aunque la mayoría de las grandes organizaciones editoriales han emitido directrices para el uso de IA por parte de autores, las políticas claras para revisores y editores siguen siendo escasas o ambiguas [1, 2, 3]. Estudios empíricos sobre el efecto de la IA en la disposición de los autores a enviar manuscritos o en la confianza pública en el sistema científico son limitados o ausentes [4-8].

ANÁLISIS E INTERPRETACIÓN

Estos hallazgos confirman el valor instrumental de la IA para superar cuellos de botella logísticos y mejorar ciertas dimensiones objetivas (velocidad, cobertura, detección de errores) del proceso de revisión. Sin embargo, los sistemas actuales muestran carencias en el juicio crítico, la identificación de aportes novedosos y la argumentación contextualizada, elementos centrales para la evaluación científica rigurosa [1, 4, 5]. La proliferación de resultados automatizados plantea incógnitas sobre la integridad intelectual, el reconocimiento del trabajo humano y la potencial devaluación de los revisores, así como nuevos desafíos de equidad

y justicia, dado el riesgo de sesgos algorítmicos [3, 7, 10]. La literatura resalta un desfase entre la rápida adopción tecnológica y el desarrollo de políticas de gobernanza y responsabilidad. Mientras la Unión Europea reconoce estos sistemas como de alto riesgo en el marco regulatorio del AI Act (Diario Oficial de la Unión Europea el 12 de julio de 2024, https://commission.europa.eu/news/ai-act-enters-force-2024-08-01_es), la implementación de directrices institucionales efectivas y la armonización internacional aún están lejos de ser una realidad [1-3].

DISCUSIÓN Y PERSPECTIVAS

El campo editorial científico se halla en una encrucijada: abrazar la aceleración y potencial democratización que provee la IA, o arriesgarse a una desvalorización del juicio crítico y la confianza en la ciencia. Los beneficios prácticos, particularmente en la clasificación y asignación de revisores, son indudables, pero sin un contrapeso ético y regulatorio, pueden profundizar desigualdades o alimentar prácticas cuestionables. Es necesario avanzar hacia políticas explícitas, transparencia en el uso de IA y capacitación sistemática de editores, revisores y autores para trabajar en entornos híbridos. El desarrollo de métricas más precisas de impacto real—incluyendo efectos en la confianza, tasas de envío, calidad final y consecuencias no intencionadas—constituye un reto inmediato para la investigación futura [1, 4, 10]. La falta de datos empíricos sobre los efectos de la IA en la conducta de los autores y la aceptación social del sistema de revisión automatizado deja abierta una cuestión crítica para el diseño de políticas basadas en evidencia.

CONCLUSIÓN

La inteligencia artificial ya es parte integral del ecosistema editorial, acelerando y transformando la revisión por pares, pero no puede—ni

debe—sustituir la supervisión y deliberación humanas. Sólo un equilibrio informado entre innovación tecnológica y rigor ético permitirá garantizar la integridad, equidad y confianza en la ciencia publicada. Hoy más que nunca, la comunidad académica está llamada a definir reglas claras y mecanismos de rendición de cuentas para una colaboración transparente y responsable entre humanos y máquinas en la evaluación científica.

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REFERENCIAS RELACIONADAS

Este artículo se acompaña de documentación complementaria en inglés:

- Artificial Intelligence in Peer Review: Acceleration Without Losing Scientific Integrity? Supplementary Documentation.
- Excel con bibliografía relacionada.

ARTÍCULO ORIGINAL

SÍNCOPE VASOVAGALES Y TUMORES DE CABEZA Y CUELLO. ESTUDIO RETROSPECTIVO

Vasovagal Syncope and Head and Neck Tumors. Retrospective Study

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Fecha de recepción: 30 de septiembre de 2024

Fecha de aceptación: 1 de febrero de 2025

Fecha de publicación: 15 de marzo de 2025

Fecha de publicación del fascículo: 27 de junio de 2025

Conflicto de intereses: Los autores declaran no tener conflictos de intereses

Imágenes: Los autores declaran haber obtenido las imágenes con el permiso de los pacientes

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RESUMEN: Introducción y objetivos: El síncope, aunque raro, puede ser una manifestación de tumores de cabeza y cuello. Se han descrito tres cuadros clínicos: síndrome del seno carotideo, neuralgia – asistolia glossofaríngea, y síndrome del espacio parafaríngeo. Nuestro objetivo fue definir las características clínicas de estos síncope en nuestro hospital. Métodos: Estudio retrospectivo descriptivo de pacientes con tumores de cabeza y cuello que presentaron síncope relacionados, diagnosticados entre enero de 2012 y abril de 2022 en el Hospital Universitario Marqués de Valdecilla. Resultados: Cinco pacientes con cáncer de cabeza y cuello mostraron síncope relacionados con su patología. Fueron dos mujeres y tres hombres, con una media de edad de 70 años. Todos tenían afectación del espacio parafaríngeo. Dos presentaron síncope antes del diagnóstico y tres después. Conclusiones: El síncope debe considerarse en el diagnóstico diferencial de tumores de cabeza y cuello, especialmente tras descartar patología cardiovascular. En pacientes ya diagnosticados, puede indicar afectación del espacio parafaríngeo.

PALABRAS CLAVE: síncope; tumores cabeza y cuello; seno carotideo; espacio parafaríngeo.

SUMMARY: Introduction and objectives: Syncope, although rare, can be a manifestation of head and neck tumors. Three clinical pictures have been described: Carotid sinus syndrome, Neuralgia – glossopharyngeal asystole, and Parapharyngeal space syndrome. Our objective was to define the clinical characteristics of these syncopes in our hospital. Methods: Retrospective descriptive study of patients with head and neck tumors who presented related syncope, diagnosed between January 2012 and April 2022 at the Marqués de Valdecilla University Hospital. Results: Five patients with head and neck cancer showed syncope related to their pathology. There were two women and three men, with an average age of 70 years. All had involvement of the parapharyngeal space. Two presented syncope before diagnosis and three after. Conclusions: Syncope should be considered in the differential diagnosis of head and neck tumors, especially after ruling out cardiovascular pathology. In patients already diagnosed, it may indicate involvement of the parapharyngeal space.

KEYWORDS: syncope; head and neck neoplasms; carotid sinus; parapharyngeal space.

INTRODUCCIÓN

El síncope se define como la pérdida súbita y breve de la consciencia, acompañada de la ausencia de tono postural y seguida de una recuperación espontánea completa, sin secuelas, debido a una disminución del riego cerebral [1]. Es una causa frecuente de consulta en el Servicio de Urgencias, siendo el síncope vasovagal la forma más común de pérdida transitoria de conocimiento [2]. El diagnóstico diferencial es extenso e incluye enfermedades cardíacas, pulmonares, trastornos metabólicos y epilepsia, entre otros. Aunque no exista una etiología claramente definida, se sugiere que el síncope podría ser el resultado de un fallo del sistema de autorregulación de la presión arterial (PA) o una medida de protección ante situaciones que requieren una disminución de la circulación sanguínea [3].

Los barorreceptores juegan un papel crucial en la regulación de la PA. Ante un aumento de esta, detectan la distensión del vaso sanguíneo y envían una señal al núcleo del tracto solitario. Esta señal puede originarse en los barorreceptores del seno carotideo, a través del nervio de Hering (rama del IX par craneal, el nervio glossofaríngeo), o del cayado aórtico, a través del nervio vago (X par craneal). El núcleo del tracto solitario activa el sistema parasimpático, reduciendo la frecuencia cardíaca (FC) al disminuir el estímulo vagal sobre

el corazón, y al mismo tiempo inhibe al sistema simpático, lo que provoca vasodilatación arterial periférica. En caso de hipotensión, no se estimula el sistema parasimpático, permitiendo que el nervio vago aumente la FC [2, 3].

Aunque no es una manifestación común, el síncope puede estar asociado con tumores de cabeza y cuello. Se han documentado tres cuadros clínicos relacionados con el diagnóstico, tratamiento o recidiva del tumor: síndrome del seno carotideo (SSC) por compresión o invasión tumoral generando un reflejo vagal aumentado; síndrome de neuralgia - asistolia glossofaríngea, y síndrome del espacio parafaríngeo [3].

El síndrome del seno carotideo es una causa frecuente de síncope recurrentes, especialmente en personas de edad avanzada, alcanzando hasta el 1 % de la etiología de los síncope. Diversas lesiones ocupantes de espacio pueden desencadenar síncope al comprimir o invadir el seno carotideo. El síncope secundario al SSC puede aparecer como síntoma inicial, tras una intervención quirúrgica o radioterapia, o como indicador de recurrencia local [4]. El mecanismo subyacente implica la activación anómala del reflejo barorreceptor en el seno carotideo, resultando en bradicardia sinusal, pausas sinusales y/o alteraciones en la conducción auriculoventricular, asociada o no a hipotensión [5].

La neuralgia glossofaríngea es un dolor breve, unilateral, punzante y abrupto en distribuciones

no solo del nervio glossofaríngeo, sino también, en las ramas auricular y faríngea del nervio vago. Su etiología principal es la compresión neurovascular, aunque también puede ser secundaria a enfermedades subyacentes, como los tumores de cabeza y cuello [5, 6]. En raras ocasiones, la neuralgia se puede acompañar de un síncope, dando lugar al síndrome de neuralgia – asistolia glossofaríngea. Este síndrome se produce por la estimulación anómala de las fibras del seno carotídeo que, al activarse, generan el reflejo barorreceptor [7].

En algunos artículos se describe el síndrome del seno parafaríngeo, donde las lesiones en el espacio parafaríngeo pueden irritar las fibras aferentes del nervio glossofaríngeo, lo que provoca síncope mediante la activación del reflejo cardiovascular a través del nervio de Hering [8].

El objetivo de este estudio fue identificar las características clínicas de los pacientes con tumores de cabeza y cuello que presentaron síncope vasovagales, ya sea al momento del diagnóstico o durante su evolución.

MATERIAL Y MÉTODO

Se realizó un estudio retrospectivo descriptivo de todos los pacientes diagnosticados de tumores de cabeza y cuello que presentaron síncope relacionados con la etiología tumoral en el Servicio de Otorrinolaringología del Hospital Universitario Marqués de Valdecilla de Santander entre enero de 2012 y abril de 2024. Las variables estudiadas incluyeron: edad, sexo, localización del tumor primario, estadio, hallazgos radiológicos, estudio histopatológico, tratamiento realizado (para el tumor primario y los síncope) y evolución del cuadro sincopal.

Este estudio fue aprobado por el Comité de Ética en Investigación Clínica de Cantabria (CEIM), con número de expediente 2024.131. Se siguieron los postulados de Helsinki para estudios biomédicos.

RESULTADOS

De los pacientes con tumores de cabeza y cuello atendidos en el período mencionado, cinco, con edades entre 61 y 90 años (3 varones y 2 mujeres), presentaron síncope recurrentes relacionados con la patología tumoral [Tabla 1], tras una exploración cardiológica y neurológica normal. Excepto en dos casos (n.º 1 y 3), en el resto, la clínica sincopal apareció después del diagnóstico de la enfermedad. Solo uno de ellos requirió tratamiento específico para los síncope mediante la implantación de un marcapasos. En uno caso (paciente mujer), la tumoración era benigna. Salvo en un caso en que la tumoración se localizaba en la orofaringe, el resto de los tumores afectaban el espacio parafaríngeo.

DISCUSIÓN

El síncope recurrente asociado a tumores de cabeza y cuello es una manifestación rara, que generalmente ocurre debido a la invasión del espacio parafaríngeo, como se observó en cuatro de nuestros pacientes, o por lesiones que estimulan al nervio vago/glossofaríngeo, tal como se evidenció en uno de los casos. La literatura médica sobre este fenómeno es limitada, y la totalidad de los casos publicados hasta la fecha son casos aislados [3].

Su incidencia es mayor en casos de tumores malignos, especialmente carcinomas epidermoides, y en menor medida en linfomas, debido a su mayor capacidad invasiva en comparación con los tumores benignos [4]. En nuestra serie de casos, solo una paciente presentó un tumor benigno, específicamente un adenoma pleomorfo en espacio parafaríngeo, una condición extremadamente inusual pero previamente documentada [9].

El caso n.º 1 mostró infiltración carotídea en las imágenes de TC, lo que sugiere la estimulación del seno carotídeo por invasión tumoral. El caso n.º 4 presentó síntomas compatibles con el síndrome de neuralgia – asistolia glossofaríngea, con episodios breves de dolor punzante ascendente en la región del

Tabla 1. Resumen de las características principales de los pacientes.

	Clinica	Sexo	Edad	Tumor primario	Histología Estadíaje	Técnicas de imagen	Tratamiento	Evolución de los cuadros sincopales
1	Síndrome del seno carotideo	Varón	66	Laringe (Supraglotis)	Carcinoma epidermoide (T2N3bM0)	TC: Adenopatía parafaríngea rodeando la bifurcación carotídea	QT/RT	Desaparición tras tratamiento del tumor primario
2	Síndrome del seno carotideo	Mujer	73	Orofaringe (amígdala)		TC: Adenopatía con invasión de espacio parafaríngeo (Figura 1) PET: Captación en hemilengua y amígdala izquierdas (Figura 2)	QT/RT	Persistencia de sincopes
3	Síndrome del seno carotideo	Mujer	61	Tumoración parafaríngea izquierda	Adenoma pleomorfo	RM: Tumoración parafaríngea izquierda dependiente de lóbulo profundo de glándula parótida izquierda (Figura 3)	Parotidectomía total	Desaparición tras tratamiento del tumor primario
4	Síndrome de neuralgia - asistolia glosfaríngea	Varón	64	Orofaringe (paladar blando)	Carcinoma epidermoide (T3N2bM0)	TC: Tumoración orofaríngea	QT/RT	Desaparición tras tratamiento del tumor primario
5	Síndrome del seno carotideo	Varón	90	Orofaringe (base de lengua)	Carcinoma epidermoide (T2N3M0)	TC: Adenopatía metastásica en el espacio parafaríngeo	RT	Marcapasos

QT/RT: quimioterapia/radioterapia

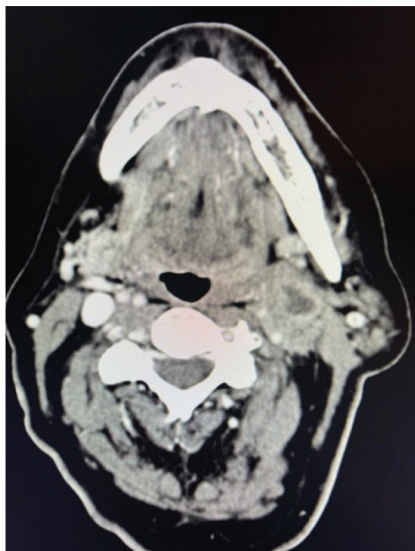


Figura 1. TC. tumor necrótica espacio parafaríngeo izquierdo.

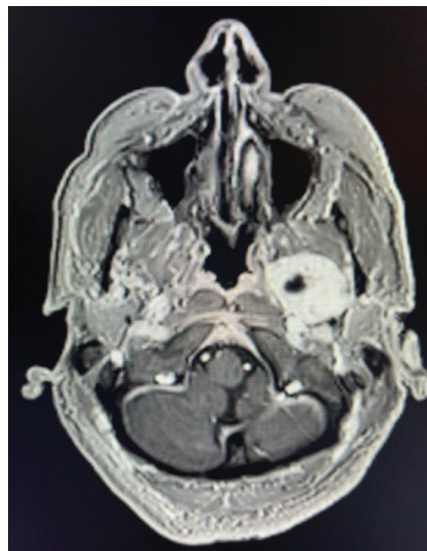


Figura 3. RM. tumor en el lóbulo profundo parótida izquierda.



Figura 2. PET:captación en tumor laterocervical, hemilengua y amígdala izquierdos.

nervio glossofaríngeo, seguidos de síncope. Aunque algunos autores describen el Síndrome del espacio parafaríngeo [8], creemos que el mecanismo es muy similar al del Síndrome de seno carotídeo, por lo que asociamos el resto de nuestros casos a este último.

En cuanto a la relación del síncope con el diagnóstico de los tumores de cabeza y cuello, en los casos n.º 1 y 3, el síncope fue el primer síntoma, lo que llevó al diagnóstico del tumor. En los demás casos, el síncope ocurrió después del diagnóstico y el inicio del tratamiento.

Es indispensable descartar patologías cardíacas y neurológicas antes de atribuir los síncope a tumores en cabeza y cuello, evaluando a los pacientes con especialistas en estas áreas.

La evaluación radiológica ayuda a identificar la relación entre la tumoración y las áreas que podrían desencadenar los síncope, como la orofaringe o el espacio parafaríngeo. Aunque la TC y el PET-TC son útiles, la resonancia magnética (RM) proporciona una mejor visualización de tejidos blandos y la relación con el seno carotídeo [8].

De los cinco pacientes con tumores de cabeza y cuello, tres recibieron quimio/radioterapia, uno solo radioterapia y otro, con un tumor benigno, fue operado.

El tratamiento definitivo del síncope suele implicar la cirugía del tumor, cuando es posible, o la reducción del tamaño tumoral mediante QT/RT [3, 7]. En los casos en que el síncope fue el síntoma inicial, un paciente fue operado y otro recibió QTRT, lo que resolvió los episodios de síncope en ambos. Sin embargo, en los pacientes que presentaron síncope tras el diagnóstico del tumor, uno no mejoró con QTRT, mientras que el otro sí.

De nuestra casuística, solo un paciente (n.º 5) recibió tratamiento específico para los síncope mediante la implantación de un marcapasos. También se han aplicado técnicas de cardioablación con buenos resultados [10]. Algunos autores sugieren la implantación de marcapasos en casos donde predomina la respuesta cardiorritmizante, así como el uso de vasopresores cuando predomina la respuesta vasodilatadora [3, 7].

Este estudio presenta varias limitaciones importantes. El tamaño de la muestra es pequeño, lo que restringe la capacidad para realizar generalizaciones robustas sobre la relación entre los tumores de cabeza y cuello y el síncope. Además, existe el riesgo de sesgo de selección, dado que se trata de un estudio retrospectivo realizado en un único centro hospitalario. Para superar estas limitaciones y aumentar la validez de los resultados, se recomienda la realización de estudios multicéntricos que incluyan una muestra más grande de pacientes. Esto permitiría una mejor generalización de los resultados y proporcionaría una visión más amplia sobre el manejo y la prevalencia del síncope en pacientes con tumores de cabeza y cuello.

CONCLUSIONES

El síncope, aunque infrecuente, puede constituir una manifestación clínica de los tumores de cabeza y cuello, tanto benignos como malignos.

Esta condición puede presentarse antes del diagnóstico de la enfermedad o posteriormente al tratamiento, debido a la progresión tumoral o a la falta de éxito terapéutico. Generalmente, el síncope ocurre por invasión del espacio parafaríngeo; no obstante, también puede afectar otras áreas inervadas por el nervio glosofaríngeo o el nervio vago. En casos de síncope recurrentes sin una causa cardiovascular evidente, es esencial considerar la posible relación con una patología tumoral. Resulta crucial tener presente esta eventualidad, especialmente en pacientes con diagnóstico confirmado de tumor, y proceder a una evaluación radiológica exhaustiva del espacio parafaríngeo y retrofaríngeo si estos pacientes experimentan síncope sin una causa aparente, ya que dichos episodios podrían ser indicativos de progresión tumoral.

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ARTÍCULO ORIGINAL

COMPLICATIONS OF NASOPHARYNGEAL SWAB IN THE DIAGNOSIS OF SUSPECTED COVID-19

Complicaciones del frotis nasofaríngeo en el diagnóstico de sospecha de COVID-19

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Reception date: October 14, 2024

Date of Acceptance: November 30, 2024

Publication date: January 20, 2025

Date of publication of the issue: June 27, 2025

Conflict of interest: The authors declare no conflicts of interest

Images: The authors declare that the images have been obtained with the permission of the patients

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SUMMARY: Introduction and objectives: The most sensitive direct diagnostic test for COVID-19 involves collecting nasopharyngeal swab samples for subsequent analysis using RT-PCR. Nevertheless, this technique is invasive, requiring adequate training of the personnel responsible for its execution and is not without potential adverse effects. The aim of this study was to investigate the complications associated with nasopharyngeal swab sampling in patients suspected of SARS-CoV-2 infection. Methods: We prospectively collected complications arising from nasopharyngeal swab procedures treated in the Otorhinolaryngology Service of the Marqués de Valdecilla University Hospital in Santander, since the beginning of the pandemic. Results: Out of 363,070 PCR samples collected during the study period, twenty patients (0.0055 %) between the ages of 29 and 90 years experienced complications related to nasopharyngeal swab sampling for COVID-19 diagnosis. Immediate complications were observed in all cases. The most frequent one was mild to moderate epistaxis (two patients experienced repeated nosebleeds, requiring multiple visits

to the emergency department), as well as swab breakage and impaction in the nasal cavity, with one case of accidental ingestion without consequences. Two patients had swabs impacted without breakage. No severe complications or subsequent sequelae were reported. Conclusions: Nasopharyngeal swab sampling is a generally safe technique when performed by adequately trained personnel with knowledge of nasal anatomy and the proper execution of the procedure. Although complications are exceptionally rare and typically mild, isolated cases of severe side effects have been documented.

KEYWORDS: COVID-19; nasopharynx; nasopharyngeal swab; diagnosis; complications.

RESUMEN: Introducción y objetivos: La prueba diagnóstica directa más sensible para COVID-19 implica la recolección de muestras mediante frotis nasofaríngeo para su posterior análisis mediante RT-PCR. No obstante, esta técnica es invasiva, requiere una capacitación adecuada del personal responsable de su ejecución y no está exenta de posibles efectos adversos. El objetivo de este estudio fue investigar las complicaciones asociadas con la toma de muestras con nasofaríngeas en pacientes con sospecha de infección por SARS-CoV-2. Métodos: Recogimos prospectivamente las complicaciones derivadas de los procedimientos toma de muestras nasofaríngeas, tratados en el Servicio de Otorrinolaringología del Hospital Universitario Marqués de Valdecilla en Santander, desde el inicio de la pandemia. Resultados: De las 363,070 muestras de PCR recogidas durante el período de estudio, veinte pacientes (0.0055 %) con edades comprendidas entre 29 y 90 años experimentaron complicaciones relacionadas con la toma de muestras nasofaríngeas para el diagnóstico de COVID-19. Las complicaciones fueron inmediatas en todos los casos. La más frecuente fue la epistaxis leve a moderada (dos pacientes experimentaron hemorragias nasales repetidas, requiriendo múltiples visitas al Servicio de urgencias), así como la rotura e impactación del hisopo en la cavidad nasal. No se objetivaron complicaciones graves ni secuelas posteriores. Conclusiones: La toma de muestras nasofaríngeas mediante hisopo es una técnica generalmente segura cuando es realizada por personal adecuadamente capacitado con conocimientos de la anatomía nasal y la ejecución correcta del procedimiento. Aunque las complicaciones son excepcionalmente raras y típicamente leves, se han documentado casos aislados de efectos secundarios graves.

PALABRAS CLAVE: COVID-19; nasofaringe; hisopo nasofaríngeo; diagnóstico; complicaciones.

INTRODUCTION

Early and accurate diagnosis was a crucial aspect of effectively managing the COVID-19 pandemic. The gold standard for diagnosis in the early stages of the disease is the collection of nasopharyngeal swab samples for analysis using reverse transcription polymerase chain reaction (RT-PCR) to detect viral RNA, primarily from the SARS-CoV-2 virus [1]. The sensitivity of this diagnostic method varies depending on the timing of sample collection (closely linked to the viral load), the severity of the clinical presentation, the technique employed, post-sampling handling, and the RT-PCR methodology [1, 2]. Notably, this method

exhibits a low rate of false-positive results [1]. However, it necessitates proper training to ensure its accurate application and prevent complications. While alternative methods that avoid nasal entry have been proposed for nasopharyngeal sampling [3], the traditional approach through the nasal passage remains the most common.

With the urgent need to conduct widespread diagnostic testing to control COVID-19 and future viral pandemics, various healthcare professionals are responsible for administering these tests. Ideally, these professionals should undergo adequate training to ensure safe sample collection [4]. In cases where accessing the nasopharynx is challenging, bilateral or combined anterior nasal sampling,

along with oropharyngeal sampling, may be sufficient [5]. Another alternative is saliva samples, although they exhibit lower sensitivity compared to nasopharyngeal samples [5-6]. Failure to adhere to these fundamental practices can result in incorrect sample collection, leading to false-negative results, significant discomfort, or complications [7].

The objective of our study was to investigate complications related to nasopharyngeal sampling during the early phases of the COVID-19 pandemic in the Cantabria region.

MATERIAL AND METHODS

We prospectively collected data on complications associated with nasopharyngeal sample collection in the Otorhinolaryngology Service at Marqués de Valdecilla Hospital, located in Santander, Cantabria (Spain), from March 1, 2020, to January 31, 2021. Data collected for each case included the patient's age, gender, type of complication, administered treatment, and any lasting sequelae.

Data were entered into a Microsoft Excel program and subjected to descriptive statistical analysis.

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by Ethics Committee for Research with Medicines and Health Products of Cantabria (CEIM) (identification code 2023.397, Acta: 20/2023 de 24/11/2023).

RESULTS

Throughout the study period, a total of 363,070 nasopharyngeal PCR swab samples were collected in our Autonomous Community for COVID-19 diagnosis using RT-PCR. These samples were primarily collected by nursing staff specially trained for this purpose. Out of these, 20 patients (0.0055 %

or 1 in 18,153) experienced complications that necessitated otorhinolaryngological intervention. These patients ranged in age from 29 to 90 years.

The complications that were observed are summarized in Table 1, with mild to moderate epistaxis being the most common, requiring anterior tamponade with materials such as gauze, RapidRhino®, or Merocel®. Two patients experienced several episodes of epistaxis, requiring multiple visits to the emergency room and several tamponade procedures with local anesthesia. The second most prevalent complication was swab breakage with subsequent impaction in the nasal cavity, which was successfully removed under local anesthesia and endoscopic guidance in all cases, without any further complications. Two additional patients had swabs impacted in the nasal cavity, without breakage, and these were also safely removed with local anesthesia and endoscopic guidance. No patients required hospital admission or surgical procedures, and they did not experience any lasting sequelae.

Table 1. Complications of nasopharyngeal swab sampling

Age/sex	Complication	Treatment
45/female	Moderate epistaxis (anticoagulant treatment)	Anterior nasal packing with gauze
46/male	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
49/male	Breakage and impaction of the swab.	No treatment (The patient swallows it)
79/male	Moderate epistaxis	Anterior nasal packing with gauze
70/female	Moderate epistaxis	Nasal packing with Rhapid Rhino®
80/female	Moderate epistaxis (fibrinolytics treatment)	Nasal packing with Rhapid Rhino®
44/female	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.

(continued)

Table 1. Complications of nasopharyngeal swab sampling (*continued*)

Age/sex	Complication	Treatment
48/male	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
62/female	Impaction of the swab (without breakage)	Extraction on an outpatient basis with local anesthesia with endoscopy.
48/male	Impaction of the swab (without breakage)	Extraction on an outpatient basis with local anesthesia with endoscopy.
67/female	Recurrent epistaxis	Several anterior nasal packing
64/female	Mild epistaxis	Nasal packing with Merocel®
43/female	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
29/male	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
90/male	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
55/male	Breakage and impaction of the swab.	Extraction on an outpatient basis with local anesthesia with endoscopy.
30/female	Mild epistaxis	Anterior nasal packing with gauze
75/male	Recurrent moderate epistaxis	Nasal packing with Merocel®
65/male	Mild epistaxis	Anterior nasal packing with gauze
62/male	Mild epistaxis	Nasal packing with Merocel®

DISCUSSION

Nasopharyngeal swab sampling is the preferred diagnostic method for detecting SARS-CoV-2 infection, especially when collected within 2-3 days prior to symptom onset or within the first week of symptom presentation, as it offers high sensitivity [5]. However, this diagnostic technique is not without its complexities and potential complications. The main reasons for complications are typically related to inadequate training of the personnel responsible for the procedure, including a lack of

knowledge about intranasal anatomy. This can result in swabs being directed incorrectly, towards the eye, rather than towards the middle or lower part of the pinna. Swabs may also deviate laterally or inward, or excessive force may be applied if met with resistance. It is important to note that a significant proportion of the population has asymptomatic septal deviations. Other risk factors for complications include coagulopathies or thrombocytopenia [8].

In our study, we observed a complication rate of 0.0055 % (1 in 18,153), which is higher than the rate reported by Koskinen et al. at 1.24 per 100,000 (1 in 80,645). It's worth noting that their study was retrospective [9]. However, our rate was lower than that reported by Foh in a small sample of individuals, which was 0.024, likely influenced by the criteria used [10].

A common complication in our series was swab breakage, leading to impaction in the nasal cavity. In all cases, removal was performed in outpatient settings under endoscopic guidance without subsequent complications. However, in cases involving children, removal under general anesthesia may be necessary [11]. It is important to mention that while swab breakage typically occurs at the predetermined breaking point before the swab is placed in the transport medium, there are cases, as observed in one of our patients, where breakage occurs at a different level.

Some authors recommend the use of swabs that are not designed to break [12]. However, this can complicate their subsequent handling, as they either need to be cut with other means or sent to the laboratory in longer containers.

Less frequently encountered is swab impaction without breakage, which prevents the healthcare worker from removing it. This occurred in two patients and is likely related to slight forceful insertion and subsequent nasal mucosa edema formation, hindering extraction. In both cases, it was relatively straightforward to remove the swab on an outpatient basis. In certain cases, the residual swab may

be ingested, and although some recommend early upper gastrointestinal endoscopy to prevent complications [13], one patient in our series swallowed a swab fragment without subsequent complications. Nonetheless, it has been previously documented that intestinal perforation can occur [7].

Another frequently observed complication in our series was epistaxis. In nearly all cases, these were patients without a history of coagulopathies or systemic vascular conditions, experiencing mild to moderate nasal bleeding that required anterior nasal packing with non-absorbable materials. While some guidelines suggest using absorbable tampons during times of high SARS-CoV-2 virus infection risk [14], practical considerations often lead to the use of tampons that require later removal for rapid patient treatment and reduced exposure to aerosols [15].

In other series, mild epistaxis, along with foreign body impaction, was also the most common complication [7, 9, 11]. However, life-threatening epistaxis cases have been reported, necessitating endoscopic sinus surgery or endovascular treatment under general anesthesia, sometimes involving repeated transfusions, and occasionally complicated by septic conditions or leading to septal perforation as a sequel due to repeated nasal packing [9, 16].

Although there are few contraindications for nasopharyngeal swab sample collection, it should be avoided in patients with a history of recurrent epistaxis due to hereditary hemorrhagic telangiectasia (Rendu-Osler-Weber disease) [17, 18], those with coagulopathies or thrombocytopenias, and individuals with a history of significant prior nasal bleeding. Nasopharyngeal swab testing can induce severe bleeding in such cases, necessitating hospitalization for management. This is especially critical for children undergoing hematological oncological treatments, as they are prone to nasal hemorrhagic complications, prompting the need for guidelines for sampling in this patient group [8].

For these patients, oropharyngeal swabs or saliva samples are recommended, albeit with the

awareness that their sensitivity is lower (5, 8). Additionally, in nursing homes where COVID-19 outbreaks are frequent and require nasopharyngeal swabs, almost 40 % of the population is on anticoagulant treatment [19, 20]. Therefore, it is crucial to insert the swab gently, seeking the natural passage area, without excessive force. If this is not possible, an anterior nasal, oropharyngeal, combined, or saliva sample should be obtained [5].

Caution should be exercised when dealing with individuals who have a history of nasal trauma or recent sinonasal surgery [20]. In cases of severe nasal obstruction due to septal deviation, completing the procedure properly may be challenging, and it is advisable to perform an anterior nasal swab [5]. When dealing with children, difficulties may arise due to their limited cooperation and the challenge of reaching the nasopharynx. In such cases, it is important to avoid forcibly inserting the swab.

While our series did not include patients with serious complications, the literature reports several cases, including severe epistaxis [8], cribriform plate fracture with subsequent cerebrospinal fluid leakage [21], leading to meningitis [22] or brain abscess [23]. Some of these cases had a history of previous skull base surgery and the development of secondary encephalocele [17], which likely increased the risk of complications. In other cases, complications arose due to suboptimal diagnostic techniques without preexisting nasal abnormalities [20]. Table 2 provides a summary of complications described in the literature.

In a comparative study conducted by Gupta et al. to assess complications associated with the use of commercial swabs versus 3D printed swabs, both groups experienced epistaxis as the most common complication. However, epistaxis occurred more frequently with conventional swabs, and only one patient required emergency assistance due to uncontrolled epistaxis at the sampling site [30].

It is essential to consider the use of proper protective measures when caring for these patients to prevent potential transmission to healthcare

Table 2. Complications described in the literature related to the use of swabs for nasopharyngeal sampling

Anterior or posterior epistaxis: mild to very severe [8-10,15]
Partial or total impaction of the swab [7, 9, 10, 24]
Cribriform plate fracture with secondary liquorrhea [25]
Meningitis [22]
Fracture of the orbital lamina papyracea [26]
Subperiosteal orbital abscess [27]
Orbital cellulitis [26, 27]
Brain abscess [23]
Septal abscess [7]
Intestinal perforation [28]
Foreign body impaction in bronchi [29]
Sinus infection [26]

professionals. Many of these patients have a high suspicion of SARS-CoV-2 infection or are close contacts [15].

One of the main limitations of our study is that milder cases may not have presented to our Otorhinolaryngology Service. However, considering that the Community of Cantabria has a National Health System offering free urgent care coverage across the entire region, it is unlikely that cases went to other facilities. During the study period, emergencies of this nature were primarily managed at the largest hospital center, which was the only facility with an on-call otorhinolaryngologist.

CONCLUSIONS

Despite the high number of nasopharyngeal swabs performed for COVID-19 diagnosis, the complications in our series remained mild, with no need for hospital admission or surgical interventions, and no permanent sequelae were observed. This outcome is attributed to the extensive training courses provided to nursing staff involved in swab collection since the beginning of the pandemic. The most common complications observed were epistaxis and partial swab impaction.

ACKNOWLEDGMENTS

We extend our gratitude to Eugenia López Simón, Patricia Corriols Noval, and Yaiza García Ibañez for their invaluable contributions in acquiring the clinical data.

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ARTÍCULO DE REVISIÓN

NEUROVASCULAR ANATOMY REVIEW IN THYROID AND PARATHYROID SURGERY. SURGICAL PROCEDURE TO MINIMIZE ADVERSE EVENTS

Revisión anatómica neurovascular en cirugía tiroidea y paratiroidea. Sistemática quirúrgica para minimizar eventos adversos

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Reception date: April 23, 2024

Date of Acceptance: May 21, 2024

Publication date: June 11, 2024

Date of publication of the issue: June 27, 2025

Conflict of interest: The authors declare no conflicts of interest

Images: The authors declare that the images have been obtained with the permission of the patients

Rights policy and self-archive: the self-archive of the post-print version (SHERPA / RoMEO) is allowed

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SUMMARY: Introduction and objective: Recurrent laryngeal nerve (RLN) injury is the most important complication in thyroid surgery and its side effects vary from dysphonia in unilateral laryngeal paralysis to stridor in bilateral laryngeal paralysis. Therefore, the anatomical identification and functional preservation of the nerve is essential in thyroid surgery. A variety of landmarks have been classically considered for this nerve's identification, including the inferior thyroid artery (ITA), Zuckerkandl's tubercle and Berry's and Gruber's ligaments. This study's main objective is to identify the anatomical relationship between the recurrent laryngeal nerve and the inferior thyroid artery in order to determine the surgical procedure that best avoids recurrent injury. Method: This study reviews 440 thyroidectomies performed by the same surgeon - including total thyroidectomies, hemithyroidectomies and parathyroidectomies - from September 2011 to December 2020. The relationship between the recurrent nerve's positions regarding the inferior thyroid artery was divided into prearterial, retroarterial or interarterial (between the bifurcation of branches of the artery). Other secondary variables were studied, including RLN branching, neuromonitoring, and

parathyroid gland positions and their influence on post-surgical hypoparathyroidism. In total, 695 recurrent laryngeal nerves were dissected. Results: A total of 440 patients underwent surgery. Total thyroidectomy was performed in 253, hemithyroidectomy with or without isthmectomy in 159, isolated isthmectomies in 2 and parathyroidectomies in 26 patients. A total of 695 recurrent laryngeal nerves (RLN) were dissected, 690 (99.2%) nerves were identified, being 6 of them non-recurrent right laryngeal nerves (0.8%). On the right side the predominant nerve position was prearterial (50%) and on the left side the retroarterial crossing was predominant (69%). Other variables studied were the anatomical divisions of RLN before entering the larynx, observing nerve bifurcations in 46.7% of right nerves and 29.6% of left RLN. Superior parathyroid glands were positioned in 83.7% of the cases in a high position, inferior parathyroid glands were positioned in a low position in 70% of cases. Neuromonitoring was performed in 70% of RLN and the rates of unilateral transient and permanent laryngeal paralysis were 1.2% and 0.8% respectively. Discussion: Identification and preservation of the recurrent laryngeal nerve (RLN) is paramount in thyroid surgery to prevent injury, given its variable anatomical relationship with the inferior thyroid artery (ITA). A neurovascular anatomy review is carried in a series of 440 thyroidectomies. Conclusions: The anatomical relationship between RLN and the inferior thyroid artery (ITA) is the main landmark in recurrent laryngeal nerve's surgical identification. It helps the anatomic preservation of RLN by decreasing and avoiding the feared potential nerve injuries and their subsequent complications.

KEYWORDS: recurrent laryngeal nerve; thyroidectomy; neuromonitoring.

RESUMEN: Introducción y objetivo: La lesión del nervio laríngeo recurrente (NLR) es la complicación más importante en la cirugía de tiroides y sus efectos secundarios varían desde disfonía en la parálisis laríngea unilateral hasta estridor en la parálisis laríngea bilateral. Por tanto, la identificación anatómica y preservación funcional del nervio es fundamental en la cirugía de tiroides. Clásicamente se han considerado una variedad de puntos de referencia para la identificación de este nervio, incluida la arteria tiroidea inferior (ITA), el tubérculo de Zuckerkandl y los ligamentos de Berry y Gruber. El principal objetivo de este estudio es identificar la relación anatómica entre el nervio laríngeo recurrente y la arteria tiroidea inferior para determinar el procedimiento quirúrgico que mejor evite la lesión recurrente. Método: Este estudio revisa 440 tiroidectomías realizadas por un mismo cirujano -incluyendo tiroidectomías totales, hemitiroidectomías y paratiroidectomías- desde septiembre de 2011 a diciembre de 2020. La relación entre las posiciones del nervio recurrente con respecto a la arteria tiroidea inferior se dividió en prearterial, retroarterial o interarterial (entre la bifurcación de ramas de la arteria). Se estudiaron otras variables secundarias, incluida la ramificación del NLR, la neuromonitorización y la posición de las glándulas paratiroides y su influencia en el hipoparatiroidismo posquirúrgico. En total, se diseccionaron 695 nervios laríngeos recurrentes. Resultados: Un total de 440 pacientes fueron intervenidos quirúrgicamente. Se realizó tiroidectomía total en 253, hemitiroidectomía con o sin istmectomía en 159, istmectomías aisladas en 2 y paratiroidectomías en 26 pacientes. Se diseccionaron un total de 695 nervios laríngeos recurrentes (NLR), de los que se identificaron 690 (99,2%) nervios, siendo 6 de ellos nervios laríngeos derechos no recurrentes (0,8%). En el lado derecho la posición nerviosa predominante fue prearterial (50%) y en el lado izquierdo predominó el cruce retroarterial (69%). Otras variables estudiadas fueron las divisiones anatómicas del NLR antes de ingresar a la laringe, observándose bifurcaciones nerviosas en el 46,7% de los nervios derechos y el 29,6% de los NLR izquierdos. Las glándulas paratiroides superiores se ubicaron en el 83,7% de los casos en posición alta, las glándulas paratiroides inferiores se ubicaron en posición baja en el 70% de los casos. Se realizó neuromonitorización en el 70% de los NLR y las tasas de parálisis laríngea unilateral transitoria y permanente fueron del 1,2% y 0,8% respectivamente. Discusión: La identificación y preservación del nervio laríngeo recurrente (NLR) es fundamental en la cirugía tiroidea para evitar lesiones, dada su relación anatómica variable con la arteria tiroidea inferior (ATI). Se realiza una revisión de la anatomía neurovascular en una serie de 440

tiroidectomías. Conclusiones: La relación anatómica entre el NLR y la arteria tiroidea inferior (ITA) es el principal punto de referencia en la identificación quirúrgica del nervio laríngeo recurrente. Ayuda a la preservación anatómica del NLR disminuyendo y evitando las temidas posibles lesiones nerviosas y sus posteriores complicaciones.

PALABRAS CLAVE: nervio laríngeo recurrente; tiroidectomía, neuromonitorización.

INTRODUCTION

Thyroidectomy is the most frequent surgical procedure performed within endocrine and head and neck surgery. Its surgical technique has evolved slowly over the years, with revolutionary changes during the 19th and the first half of the 20th century. Thyroid pathology was first mentioned 2700 years before Christ and Theodor Kocher is considered to be thyroid surgery's pioneer. Galen of Pergamon was the first anatomist to describe the recurrent laryngeal nerve (RLN) as a branch of a cranial nerve. Later, Vesalius and Willis described the anatomy of laryngeal nerves and specifically the RLN. Subsequently Lahey, in 1923, emphasized the importance of a standardized technique for the identification of the RLN during thyroid surgery [1].

RLN is a mixed nerve with motor, sensory and parasympathetic branches. The motor branch innervates all of the intrinsic laryngeal muscles, except for the cricothyroid muscle which is innervated by the external branch of the superior laryngeal nerve. Before entering the larynx, the RLN branches to the cricopharynxgeus muscle and the inferior constrictor muscle [2].

The most feared complication in thyroid surgery is RLN palsy. Complications range from minor dysphonia to aspiration in unilateral palsies or even dyspnea in bilateral palsies, which is potentially life-threatening. Therefore, identification and functional preservation of RLN is essential during thyroid surgery [3].

The rate of RLN palsy ranges from 0.5 to 20% worldwide (in these surgeries specifically) The risk

of recurrent laryngeal nerve injury depends on multiple factors such as thyroid pathology, surgical technique, anatomical variables and surgical experience [1-3].

Many studies have shown that identification of the RLN during thyroid surgery reduces the risk of injury and recurrent damage during dissection, hence most surgeons routinely identify the nerve during surgery. Classically, there are several anatomical structures and landmarks that help in RLN identification, such as the intersection of the nerve with the inferior thyroid artery (ITA), its course in the tracheoesophageal groove, with significant differences on the right and left side, and, if the Zuckerkandl's tubercle is present, the relationship to its position. Anatomical knowledge is of special importance, as well as its variability in the path and route of the RLN from the base of the neck to its entrance into the larynx to avoid nerve injury [4].

As previously mentioned, a fundamental anatomical structure in the recognition of RLN is the ITA (branch of the subclavian artery). Both structures are closely related and anatomically cross one-another [4].

In anatomical dissection studies, branching patterns have been observed in up to 43% of cases on both sides, divided into one or several nerve branches, and these must be taken into account. In these cases, the laryngeal motor branches are usually the anterior or internal ones. It has been reported that the distance from cricoid cartilage inferior border to the division into one or several branches ranges from 0.5 -1 cm. [5].

RLN trajectory can be altered according to other variables such as the presence of neoplasms

that can encompass the nerve, cervical or substernal compressive goiters with risk of displacement, and even inflammatory phenomena and thyroiditis. In rare exceptions the right RLN exits directly from the vagus nerve and does not present recurrence through the right subclavian artery (< 1%). These cases can associate vascular anomalies such as the presence of a retroesophageal right subclavian artery. Classically these anatomical changes have been linked to the clinical presentation of "dysphagia lusoria". In these situations, the nerve is more vulnerable and susceptible to injury during surgery [6,7].

The entrance of the RLN in the larynx is the area where it has an intimate relationship with the thyroid gland and the thyroid suspensory ligaments (Berry and Gruber's ligaments). This area presents an important vascularization and is the place where the nerve is most easily injured either by traction, thermal damage or even nerve section [8].

The aim of the study is to analyze the relationship of the RLN with ITA during thyroid surgery, as well as to see the nerve divisions and the anatomical arrangement of the parathyroid glands, with the purpose of trying to minimize postoperative complications such as recurrent injury and hypoparathyroidism.

MATERIAL AND METHODS

A retrospective clinical study was conducted in *Hospital Clínico Universitario de Valladolid* (Department of Otolaryngology (ENT)/Head and Neck Surgery) from September 2011 to December 2020 (9 years and 3 months). Ethical authorization was obtained prior to this study's design (CEIm code 21-2296). A total of 440 patients underwent thyroidectomy by the same surgeon. The mean age was 58 years with a range between 19 and 84 years of age. The prevalence by sex was mostly female, 81.1% were women (357 patients) and the remaining 18.9% were men (83 patients). Forty-six percent had no relevant previous medical

history. Hypertension was the main pathology (130 patients). 36% of the patients had a family history of thyroid cancer and only 11% had at least one of these risk factors for thyroid cancer (iodized salt deficiency, family history and previous irradiation).

The different indications for surgical treatment in our patient sample are shown in Table 1. The most common surgical indication was bilateral euthyroid multinodular goiter with a frequency of 114 patients. The second most common causes were all tied at 12, %, being a single thyroid nodule, unilateral multinodular goiter and papillary thyroid cancer.

Table 2 shows the type of surgery performed. Total thyroidectomy was performed in 253 patients, hemithyroidectomy with or without isthmectomy in 159 patients, isolated isthmectomies in 2 patients and isolated parathyroidectomies in 26 patients. Lateral therapeutic lymph node dissections were performed in 23 patients and central selective lymph node dissections were required in 10 cases. Some radiological tests were performed before surgery: ultrasound in 62% of patients, ultrasound and computed tomography (CT) in 17%, ultrasound and scintigraphy in 12% and isolated CT in 5.8% of cases.

Table 1. Surgery indication.

	Frequency	Percentage
Thyroid nodule	56	12,7%
Unilateral MNG (Multinodular goiter)	56	12,7%
Euthyroid Bilateral MNG	114	25,9%
Toxic MNG	28	6,3%
Graves-Basedow	23	5,2%
Suspected thyroid cancer	28	6,3%
Papillary thyroid carcinoma	53	12%
Carcinoma + lymph node metastases	23	5,2%
1º HPT (Hyperparathyroidism)	30	6,8%
2º HPT	3	0,6%
Medullary carcinoma	2	0,4%
MNG + HPT	24	5,4%
Total	440	100%

(MNG= Multinodular goiter, HPT= Hyperparathyroidism)

Table 2. Type of surgery performed.

	Frequency	Percentage
Hemithyroidectomy	143	33,5%
Total Thyroidectomy	205	46,5%
Isthmectomy	2	0,4%
TT + Central neck dissection	10	2,2%
TT+ Lateral neck dissection	23	5,2%
Isolated parathyroidectomy	19	4,3%
Bilateral parathyroidectomy	2	0,4%
Subtotal parathyroidectomy	2	0,4%
Unilateral double parathyroidectomy	3	0,6%
TT + Parathyroidectomy	15	3,75%
Hemithyroidectomy + Parathyroidectomy	16	3,4%
Total	440	100%

(TT= Total Thyroidectomy)

All patients underwent surgery under general anaesthesia with vocal-cord-videolaryngoscopy beforehand. The standard surgical technique was extracapsular dissection (in 64% of cases the prethyroid muscles were not sectioned, in 26% a unilateral section of the muscles was performed and in 10% a bilateral section was required), performed on all patients.

The predominant hemostasis system used during these surgeries was sealed systems and bipolar coagulation (in 378 cases), associating ligation in 62 patients.

The most important surgical steps were middle thyroid vein's ligation (if present), ligation of the superior thyroid pedicle with anatomical preservation of superior laryngeal nerve's external branch (only identified in 5.2% of cases) and identification of the RLN at its intersection with the ITA.

The ITA was considered the main anatomical reference in the identification of the RLN. On both sides, the crossing between RLN and ITA was established in three patterns; prearterial, retroarterial or interarterial, as well as the presence of one or more anatomical branches of the RLN with the aim of establishing a systematic surgical approach.

Once the RLN was identified, its trajectory was followed up to its entry into the larynx and its

relationship with other anatomical references. Other secondary variables were studied such as intraoperative neuromonitoring (NIM) of RLN and its influence on its paralysis (70% of the dissected RLN were neuromonitored) as well as the anatomical position of the parathyroid glands and its repercussion on post-surgical hypoparathyroidism. Three anatomical positions worked as references: the high position located at the level of the entrance of the RLN in the larynx, the middle position at the level of the intersection between RLN and the ITA and the low position located at the level of the thyrotympanic fat.

RESULTS

In the 440 patients studied, 695 nerves were dissected (365 right RLN and 330 left RLN). We were able to identify 690 RLNs (99.2%) of all the nerves studied, of which 6 right nerves were non-recurrent lower laryngeal nerves (0.8% of the total RLNs). The 5 RLNs that were not identified were due to isolated isthmectomies and selective parathyroidectomies. On the right side, the predominant relationship between the RLN and ITA was prearterial (50%), in 30,6% of these cases the nerve had an interarterial position and in 15,8% of the nerves were in a retroarterial position. The nerve was not identified in 1%.

On the left side the retro-arterial position predominated by 69%, followed by 21,8% interarterial and 8,7% prearterial position. Only 0.3% of the left RLN were not identified (Table 3). Sub-sternal goiters accounted for 23% of all thyroids operated on.

Table 3. RLN and ITA relationship.

	RIGHT		LEFT	
	Number	Frequency	Number	Frequency
Prearterial	185	50%	29	8,7%
Retroarterial	58	15,8%	228	69%
Interarterial	112	30,6%	72	21,8%
Non-recurrent	6	1,6%	0	0%
Not visualized	4	1%	1	0,3%
TOTAL	365	100%	330	100%

Another anatomical aspect studied was the division of the RLN before entry. There were no statistical differences between the sides, finding on the right side a single RLN in 52,1% of the cases, bifurcated RLN in 46,1% and trifurcated RLN in 1.6% of the cases. On the left side, the single branch also predominated with 69,9%, followed by the bifurcated nerve with 27.6% and the presence of 3 or more branches in 2.4% (Table 4). Non-recurrent nerves and those that were not identified were excluded.

The third anatomical variable studied was the position of the parathyroid glands (Table 5). The upper parathyroid glands were predominantly located in the high position in 83.7% of the cases and in the middle position in 16.20%. Nineteen percent of all upper parathyroid glands were not seen and only 0.75% were reimplanted.

On the other hand, the lower parathyroid glands were located in the middle position in 30% of the cases and 70% of them were located inferiorly, 37% of all the lower parathyroid glands were not identified and only 2.2% of them were reimplanted.

Another variable analyzed was neuromonitoring (Table 6). Of the 440 patients operated on, 307 (70%) were neuromonitored. In the post-surgical laryngoscopy of the neuromonitored patients,

Table 4. RLN branches.

	RIGHT		LEFT	
	Number	Frequency	Number	Frequency
Single branch	185	52,1%	230	69,9%
Bifurcated	164	46,1%	91	27,6%
Three or more branches	6	1,6%	8	2,4%
TOTAL	355	100%	329	100%

Table 5. Position of the parathyroid glands.

	Upper/Superior	Lower/Inferior
High	83,7%	0%
Medium	16,2%	30%
Low	0%	70%

Table 6. Neuromonitoring.

	Frequency	Percentage
No	133	30%
Yes	307	70%
Total	440	100%

Table 7. Neuromonitoring / laryngoscopy.

	Frequency	Percentage
TN (+ register / No paralysis)	269	87,6%
TP (- register / Unilateral Paralysis)	9	2,9%
FP (- register / No paralysis)	29	9,4%
FN (+ register / Paralysis)	0	0%
Total	307	100%

(TN: true negative; TP: true positive; FP: fake positive; FN: fake negative)

87.6% were true negatives (positive recordings without laryngeal paralysis), 9,4% false positives (negative recordings without laryngeal paralysis) and 2,9% true positives (negative recordings with unilateral laryngeal paralysis) (Table 7). In the 695 operated nerves there were 9 unilateral temporal palsies (1.2%) and 6 unilateral definite palsies (0.8%). Seventy-five percent of the temporary and 80% of the definitive palsies occurred with neuromonitoring. Of all the definitive paralyses, 4 were due to oncological pathology and one was a parathyroidectomy.

DISCUSSION

Identification and preservation of the recurrent laryngeal nerve is essential in thyroid surgery. For this purpose, anatomical knowledge of the nerve and its possible anatomical variants is essential in order to avoid injury during its dissection. The ideal way to avoid injury to RLN is to identify it and follow its recurrence during thyroid dissection carefully, since the risk of permanent nerve injury ranges between 1-10% [8]. In 1970, Riddel reported that thyroidectomy is a precise surgery and compared post-thyroidectomy laryngeal paralysis to post-surgical facial paralysis. Therefore, the

main problem during thyroid surgery is laryngeal paralysis and a surgical knowledge of cervical neurovascular anatomy is required [9]. Although still somewhat controversial, identification of the RLN is proposed as the initial step in a thyroidectomy and according to our model it's the only method to avoid injury to the RLN.

The first and most important landmark for RLN anatomical identification is the inferior thyroid artery (ITA). However, it can be difficult to identify due to the neurovascular anatomical variants and the pathological characteristics of the gland. It is not unusual for the nerve to cross the artery, either anteriorly (prearterial), posteriorly (retroarterial) or between the arterial branches (interarterial). However, the anatomical relationship between these two structures is not consistent on both sides [1].

The easiest place to injure the nerve is at the level of Berry's ligament, hence identification of the nerve in this area is risky. The most common injuries are usually tractions, thermal injuries and, less frequently, sections.

In our study we observed that a retroarterial relationship was the most frequent with a total of 286 nerves (41.1%). Prearterial crossing between RLN and ITA on both sides occurred in 214 nerves (30.7%). The interarterial nerve position was the least common, in 184 dissected nerves (26.4%).

On the right side the prearterial position predominated, being visualized in 185 nerves (50%), the interarterial position was observed in 112 nerves (30.6%) and the retroarterial position was found in 58 nerves (15.8%). On the left side the predominant nerve position was retroarterial, observed in 228 nerves (69%), the interarterial position was seen in 72 cases (21.8%) and anterior to the ITA in 29 patients (8.7%). Studies by Saldanha et al and Ardito et al observed that the most frequent relationship was retroarterial with 89% and 61% of cases respectively [1, 9]. Hisham and Lukman also observed the same relationship with a frequency of the retroarterial variant of 83.8% [10]. In contrast, the review by Sturniolo et al provided data contrary

to the majority of studies, with the retroarterial variant with percentages of 22% and 36% on the right and left sides, respectively [11].

In our study the most frequent position was retroarterial, however, not with such a high frequency, probably because the interarterial position is considered as a retroarterial variant in the aforementioned reviews. In most studies, as mentioned above, the most frequent relationship was retroarterial, especially on the left side.

On the other hand, with the aim of minimizing recurrent nerve lesions, the branching of RLN before entering the larynx was studied and it was observed that on the right side the nerve was single in 185 cases (52.1%), bifurcated in 164 cases (46.1%) and presented 3 or more branches in 6 cases (1.6%). On the left side it was observed that 230 nerves had a single trunk (69.9%), 91 nerves were bifurcated (27.6%) and 8 nerves had 3 branches (2.4%). There are few studies where the branches of RLN are observed before entering the larynx [1, 10], nevertheless, it is fundamental to identify if it is a single trunk or if it presents more branches since in this latter case the main laryngeal motor branch is the internal one being the external divisions esophageal motor branches.

In addition to the surgical experience in order to identify the divisions, neuromonitoring is very useful in these cases since the internal branch presents nerve signal and the external branch usually gives a weak or no signal. In our study we observed that the single nerve was predominant on both sides, perhaps with a higher prevalence on the left side (69.9%).

It is not uncommon to find the nerve at the level of the junction with the artery or inferior to it and it is usually recommended to ligate the ITA as close as possible to the thyroid capsule to avoid nerve injury. If this is not possible, it must be identified in the superior region close to the entrance and Berry's ligament, the area where it is most easily injured.

In concurrence with the medical literature, we observed the left nerve having a vertical trajectory

in the tracheoesophageal groove and the right nerve having a more oblique trajectory in all of our dissections.

In their review, Hunt et al found the RLN in the tracheoesophageal groove on the right and left side in 65% and 77% of cases respectively. Therefore, the tracheoesophageal groove can also be considered an anatomical landmark in this nerve's identification [8].

CONCLUSIONS

According to the medical literature, many safe surgical techniques have been described for the identification of RLN in order to decrease the rates of laryngeal paralysis. The main anatomical landmark is the crossing of the RLN with the ITA. Other landmarks to take into consideration are Zuckerkandl's tubercle, Berry's ligament or the tracheoesophageal groove. In-depth knowledge of the cervical neurovascular anatomy and its possible variants is essential in order to try to ensure the anatomical and functional integrity of the RLN. In our study we concluded that the relationship of the RLN to the ATI is a safe and consistent landmark in thyroid surgery and its identification should be a standard technique to try to avoid and minimize laryngeal paralysis.

ACKNOWLEDGMENTS

Gratitude to the Department of Otorhinolaryngology and Head and Neck Surgery and the Research Support Unit at the University Clinical Hospital of Valladolid for enabling the development of this review work.

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REVIEW ARTICLE

SYSTEMATIC REVIEW OF PLATYSMA MYOCUTANEOUS FLAP IN ORAL CANCER RECONSTRUCTION

Revisión sistemática del colgajo miocutáneo de platisma en la reconstrucción de cáncer oral

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Reception date: February 9, 2025

Date of Acceptance: April 18, 2025

Publication date: May 22, 2025

Date of publication of the issue: June 27, 2025

Conflict of interest: The authors declare no conflicts of interest

Images: The authors declare that the images have been obtained with the permission of the patients

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SUMMARY: Introduction and objective: Oral cavity reconstruction requires effective techniques to restore both functionality and aesthetics; this review evaluates the outcomes of platysma myocutaneous flaps (PMF).

Method: A systematic review with a narrative synthesis approach was performed, analyzing clinical outcomes from primary research studies. PubMed, Embase, and Scopus databases were used. The search included terms such as «platysmal flap», «oral cancer», «reconstruction», and «clinical outcomes», targeting studies on PMF for buccal squamous cell carcinoma (BSCC). Articles in all languages were considered, excluding those focused on experimental or alternative flap techniques. Risk of bias was assessed using the ROBINS-I tool.

Results: PMF and local flaps achieved high success rates in function and aesthetics; 73–82 % of patients restored normal oral intake and speech; complications like partial necrosis (6.7–10 %) were managed conservatively.

Discussion: PMF proves a versatile, time-efficient solution for intraoral defects, particularly in settings where free tissue transfer is not feasible; outcomes were most favourable for smaller defects.

Conclusions: Regional flaps, especially PMF, are effective and practical for oral cavity reconstruction, offering excellent functional recovery, aesthetic results, and quality-of-life improvements with manageable complication rates.

KEYWORDS: platysmal flap; myocutaneous flap; oral cavity reconstruction; buccal squamous cell carcinoma; dermo platysmal flap.

RESUMEN: Introducción y objetivo: La reconstrucción de la cavidad oral requiere técnicas eficaces para restaurar la función y la estética; esta revisión evalúa los resultados de los colgajos miocutáneos de platisma (PMF).

Método: Se realizó una revisión sistemática con enfoque de síntesis narrativa, analizando resultados clínicos de estudios primarios, utilizando las bases de datos PubMed, Embase y Scopus. La búsqueda incluyó términos como «platysmal flap», «oral cancer», «reconstruction», y «clinical outcomes», centrada en estudios sobre colgajos miocutáneos de platisma para carcinoma escamoso bucal. Se consideraron artículos en todos los idiomas, excluyendo aquellos enfocados en técnicas experimentales o alternativas de colgajos. La evaluación del riesgo de sesgo se llevó a cabo mediante la herramienta ROBINS-I.

Resultados: Los colgajos PMF y locales lograron altas tasas de éxito en función y estética; entre el 73 % y el 82 % de los pacientes recuperaron la ingesta oral normal y el habla. Complicaciones como la necrosis parcial (6.7–10 %) se manejaron de forma conservadora.

Discusión: Los PMF resultan ser una solución versátil y eficiente en tiempo para defectos intraorales, especialmente en entornos donde la transferencia de tejido libre no es viable; los mejores resultados se observaron en defectos pequeños.

Conclusiones: Los colgajos regionales, especialmente los PMF, son efectivos y prácticos para la reconstrucción de la cavidad oral, ofreciendo una excelente recuperación funcional, resultados estéticos y mejoras en la calidad de vida, con tasas de complicaciones manejables.

PALABRAS CLAVE: colgajo de platisma; colgajo miocutáneo; reconstrucción de cavidad oral; carcinoma escamoso bucal.

INTRODUCTION

The platysma myocutaneous flap (PMF), is a versatile yet underutilized technique in head and neck reconstructive surgery, especially for intraoral and maxillofacial defects caused by trauma or oncological resection [1-3]. First described by Futrell et al. in 1978, the PMF offers several advantages, including a thin, pliable structure, proximity to the defect site, minimal donor site morbidity, and the ability to achieve primary neck closure [1, 2].

Despite extensive literature on flap techniques in head and neck reconstruction, only three studies focus specifically on the PMF, underscoring a surprising gap in exploring its functional and aesthetic benefits, as well as its simplicity and accessibility [1-3]. The PMF is particularly effective for small to medium-sized oral cavity defects, offering functional restoration and cosmetic satisfaction with lower complication rates. Reported challenges, such as partial necrosis, dehiscence, and

venous congestion (18–45 % in some studies), can be minimized with meticulous surgical planning, including preserving the external jugular vein [2].

This review aims to identify studies on the use of myocutaneous flaps in reconstructing defects caused by oral cancer, particularly buccal squamous cell carcinoma, analyzing clinical outcomes, surgical results, and complications.

MATERIAL AND METHODS

A systematic review of the literature with a narrative synthesis approach was performed using the PubMed, Embase, and Scopus databases. Exclusively primary research sources reporting clinical data on platysma myocutaneous flaps were included. The search strategy included the following terms: (“platysmal flap”[Title/Abstract] OR “myocutaneous flap”[Title/Abstract] OR “cervical flap”[Title/Abstract]) AND (“buccal carcinoma”[Title/Abstract] OR “buccal squamous cell carcinoma”[Title/Abstract] OR “oral cancer”[Title/Abstract] OR “head and neck cancer”[Title/Abstract] OR “oral cavity cancer”[Title/Abstract]) AND (“reconstruction”[Title/Abstract] OR “surgical reconstruction”[Title/Abstract] OR “oral defect reconstruction”[Title/Abstract]) AND (“clinical outcomes”[Title/Abstract] OR “surgical outcomes”[Title/Abstract] OR “complications”[Title/Abstract] OR “case series”[Title/Abstract]).

The inclusion criteria were as follows: (1) original research on the use of platysma myocutaneous flaps for BSCC, (2) clinical studies with reported outcomes, and (3) published within the last 10 years. Articles were included without language restrictions. Studies focusing solely on other flap techniques or experimental studies without clinical application were excluded. Data were extracted on patient demographics, defect characteristics, surgical technique, postoperative outcomes, and complications. Two independent reviewers screened the articles, and discrepancies were resolved by consensus. A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020

flow diagram detailing the study selection process is provided [4] (Figure 1). The methodological quality of the included non-randomized studies was assessed using the ROBINS-I (Risk Of Bias In Non-randomized Studies of Interventions) tool. Each study was evaluated across seven domains. Overall risk of bias was classified as low, moderate, or serious, based on the cumulative assessment.

RESULTS

As shown in the PRISMA flow diagram, the described methodology resulted in 35 articles [4]. Following the detailed screening process, three studies were selected: one retrospective study, one prospective study, and one case series. We created a table specifying the authors, country, year of publication, study type, and the main results analyzed (Table 1). While there are numerous articles addressing flaps for oral cavity defect reconstruction, we have chosen to focus exclusively on platysma myocutaneous flaps, which explains the limited number of articles selected. The risk of bias of the included studies was evaluated using the ROBINS-I tool. One study (Humne et al.) presented a moderate risk of bias due to limitations in confounding control and subjective outcome measures [1]. The case series by Sahni et al. showed a serious overall risk due to small sample size, lack of comparator, and unclear reporting [2]. The retrospective study by Joshi et al. was rated as moderate risk [3] (Table 2).

DISCUSSION

PATIENT DEMOGRAPHICS AND STUDY CHARACTERISTICS

Three studies, collectively involving 144 patients, examined reconstruction for oral cavity defects. These included a prospective analysis of 30 patients utilizing platysma myocutaneous flaps (PMF) for oral and maxillofacial reconstruction, a retrospective review of 104 cases treated with local flap reconstructions (including 4 PMF cases), and

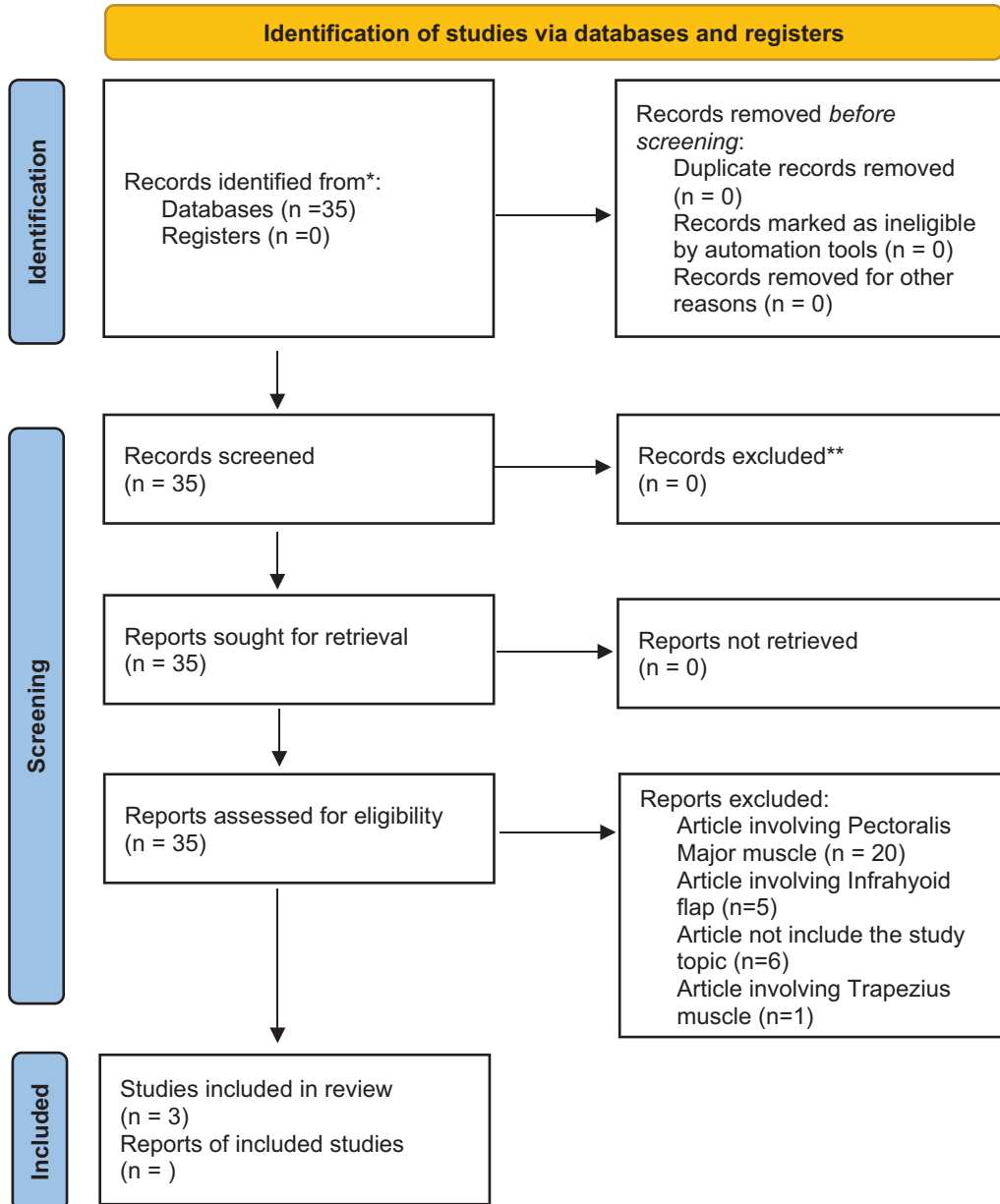


Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only.

Table 1. Table of results in order of appearance in the article.

Study	Year and country	Study type	Patients	Age range	Gender	Diagnosis	Location	Treatment	Surgical duration	Postoperative management	Complications	Follow-up	ROBINS-I Risk of Bias
Hunne A et al. [1]	India, 2024	Prospective	30	Not specified	Not specified	Oral cancer	Oral cavity	Wide local excision and PMF reconstruction	Not specified (flap harvesting <15 min.)	Regular wound care, pain management	26.67 % infection, 16.67 % dehiscence, 6.77 % necrosis	1 week, 1, 3, and 6 months	Moderate
Sahni M. et al. [2]	India, 2023	Case series	10	24-42 years	Male	Squamous cell carcinoma and nodular leukoplakia	Buccal mucosa, floor of mouth	Wide local excision and PMF reconstruction	Not specified	Prolonged nasogastric nutrition (15 days) in 2 cases	10 % partial necrosis, 10 % donor site necrosis	Not specified	Serious
Joshi P. et al. [3]	India, 2024	Retrospective	104 (4 PMF)	25-75 years	6:1 (M:F)	Squamous cell carcinoma	Buccal mucosa, floor of mouth, tongue and lip	Local flaps: 4 PMF	45-70 mins.	Nasogastric nutrition (12 days)	Partial necrosis (n=1)	6 months	Moderate

(PMF= platysma myocutaneous flaps)

Table 2. Risk of bias was assessed according to the ROBINS-I (Risk of Bias In Non-randomized Studies - of Interventions) tool.

Study	Confounding	Selection of participants	Classification of interventions	Deviations from intended interventions	Missing data	Measurement of outcomes	Selection of reported result	Overall Risk
Hunne et al. [1]	Moderate	Low	Low	Low	Low	Moderate	Low	Moderate
Sahni et al. [2]	Serious	Moderate	Low	Low	Moderate	Serious	Moderate	Serious
Joshi et al. [3]	Moderate	Low	Low	Low	Low	Moderate	Low	Moderate

a case series of 10 patients focusing on PMF for intraoral defects [1-3]. Patient ages ranged from 24 to 75 years, with a predominance of males. The male-to-female ratio in the retrospective cohort was 6:1, and the case series included exclusively male participants. Most cases involved squamous cell carcinoma (SCC) at varying stages, with some studies also addressing premalignant lesions, such as nodular leukoplakia [1-3].

SURGICAL TECHNIQUES AND TREATMENT MODALITIES

All studies employed regional or local flaps for reconstruction. The prospective analysis emphasized the PMF technique, noting an average harvesting time of under 15 minutes [1]. The retrospective review incorporated melolabial, supraclavicular, submental, and islanded facial artery myomucosal (FAMM) flaps, while the case series solely investigated PMF, highlighting its effectiveness in managing intraoral defects [2, 3]. Surgical times varied, with local flap procedures requiring 45–70 minutes, influenced by complexity, and PMF reconstruction adding minimal time beyond neck dissection [1-3].

OUTCOMES AND SUCCESS RATES

Functional and aesthetic outcomes were positive across all studies. In the prospective study, oral function and aesthetics improved significantly, as measured by the University of Washington Quality of Life questionnaire (UW-QOL). Six months post-operatively, 73.3 % of patients reported no swallowing difficulties, 76.7 % had normal taste perception, and all maintained intelligible speech, though some required repetition early in recovery [1].

The retrospective review revealed that 82.7 % of patients achieved normal oral intake, and 80.8 % retained clear speech with minimal repetition, as assessed by the Performance Status Scale for Head and Neck Cancer (PSS-HN). Outcomes were particularly favorable for small- to medium-sized

defects, with the melolabial flap achieving high success rates [3].

The case series demonstrated satisfactory cosmetic and functional outcomes in 80 % of patients, underscoring PMF's utility for intraoral reconstruction, especially in resource-constrained settings or when free tissue transfer was contraindicated [2].

COMPLICATIONS

Complication rates varied across studies. The prospective analysis reported infection (26.7 %), flap dehiscence (16.7 %), and partial necrosis (6.7 %), all managed conservatively without secondary interventions. Shoulder stiffness affected 20 % of patients at one week but resolved completely by six months [1].

In the retrospective cohort, partial necrosis was reported in only one PMF case, translating to a low complication rate for this technique. Total flap loss was noted in 1.9 % of cases across all flap types. Donor site complications, such as wound gaping and seroma formation, occurred in 5.8 % of patients and were managed conservatively. Notably, the supraclavicular flap demonstrated the highest complication rate among the local flaps studied. [3].

The case series documented partial necrosis and donor site skin loss in 10 % of patients each. One instance of complete flap loss healed by secondary intention, with all other complications managed conservatively without significant long-term effects [2].

POSTOPERATIVE MANAGEMENT AND RECOVERY

Postoperative care protocols varied across studies. In the prospective study, pain management and wound care were emphasized, resulting in 96.7 % of patients being pain-free and fully resuming daily activities by six months [1]. In the retrospective cohort, nasogastric feeding tubes were maintained for an average of 12 days, and

tracheostomy tube corking was initiated by post-operative day five in 13.5 % of cases [3]. For the case series, nasogastric nutrition was required for up to 15 days in patients with complications [2].

Although the included studies reported favorable clinical outcomes, the ROBINS-I assessment indicated moderate to serious risk of bias, especially in relation to confounding and measurement domains. These factors should be considered when interpreting the overall evidence.

These findings highlight the efficacy and safety of local and regional flap techniques, particularly PMF, for reconstructing oral cavity defects while achieving favorable functional, cosmetic, and quality-of-life outcomes.

CONCLUSIONS

The analysed studies demonstrate that platysma myocutaneous flaps, are effective options for reconstructing oral cavity defects, offering favourable functional and aesthetic outcomes. PMF is a reliable choice, especially in resource-limited settings or for patients contraindicated for free tissue transfer. While complication rates vary, most issues are manageable conservatively with minimal long-term sequelae. These techniques support optimal recovery of oral intake, speech intelligibility, and quality of

life, underscoring their clinical value in oral and maxillofacial reconstruction.

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CASE REPORT

DERMOPLATYSMAL FLAP RECONSTRUCTION FOLLOWING BUCCAL SQUAMOUS CELL CARCINOMA RESECTION

Reconstrucción con colgajo dermoplatismal tras resección de carcinoma escamoso bucal

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Reception date: January 11, 2025

Date of Acceptance: April 6, 2025

Publication date: May 23, 2025

Date of publication of the issue: June 27, 2025

Conflict of interest: The authors declare no conflicts of interest

Images: The authors declare that the images have been obtained with the permission of the patients

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SUMMARY: Introduction and objective: Squamous cell carcinoma (SCC) of the buccal mucosa is an aggressive malignancy requiring extensive resections and reconstruction. The dermoplatysmal flap is a reliable option for restoring function and aesthetics. This report evaluates its effectiveness in complex cases. Description: An 81-year-old male with HPV-positive SCC underwent tumor excision, maxillary shaving, and selective neck dissection. A dermoplatysmal flap was used for reconstruction. Recovery was uneventful, with no recurrence at 18 months.

Discussion: The dermoplatysmal flap offers robust vascularity, functional restoration, and aesthetic outcomes. Its versatility makes it ideal for large oral defects, ensuring durable results.

Conclusions: The dermoplatysmal flap is a valuable reconstructive option, ensuring oncological control, functional recovery, and aesthetic satisfaction in SCC cases.

KEYWORDS: buccal carcinoma; dermoplatysmal flap; HPV; oral reconstruction; squamous cell carcinoma.

RESUMEN: Introducción y objetivo: El carcinoma escamoso de mucosa bucal es una neoplasia agresiva que requiere resecciones extensas y reconstrucción. El colgajo dermoplatismal se presenta como una opción fiable para restaurar la función y la estética. Este caso evalúa su eficacia en casos complejos. Descripción: varón de 81 años con carcinoma escamoso positivo para VPH fue sometido a excisión tumoral, afeitado maxilar y disección selectiva del cuello. Se utilizó un colgajo dermoplatismal para la reconstrucción. La recuperación fue favorable, sin recurrencia a los 18 meses. Discusión: El colgajo dermoplatismal ofrece gran vascularización, restauración funcional y resultados estéticos. Su versatilidad lo hace ideal para grandes defectos orales, garantizando resultados duraderos. Conclusiones: El colgajo dermoplatismal es una técnica reconstructiva eficaz, asegurando control oncológico, recuperación funcional y satisfacción estética.

PALABRAS CLAVE: carcinoma bucal; colgajo dermoplatismal; VPH; reconstrucción oral; carcinoma de células escamosas.

INTRODUCTION

Squamous cell carcinoma (SCC) of the buccal mucosa is a particularly aggressive malignancy, characterized by its potential for local invasion and regional metastasis [1]. Management often involves extensive surgical resection to achieve oncological control, which frequently results in significant defects and functional impairment [1, 2]. Such defects, especially in the oral cavity, pose challenges to the restoration of essential functions like speech, mastication, and deglutition, while also impacting aesthetics and quality of life [3].

Reconstructive techniques play a critical role in addressing these challenges. The dermoplatysmal flap has gained prominence as a reliable option for covering large defects [4]. This technique offers several advantages, including robust vascularity, pliability, and ease of harvest, allowing effective restoration of both functionality and appearance. Its versatility makes it particularly suited for complex oral reconstructions, ensuring durable outcomes while minimizing donor site morbidity [4, 5]. By combining oncological safety with functional and aesthetic recovery, the dermoplatysmal flap is increasingly recognized as an optimal reconstructive solution in cases of buccal SCC [4].

DESCRIPTION

An 81-year-old male presented with a lesion on the right buccal mucosa, initially evaluated

in our hospital's otorhinolaryngology department (Figure 1A). A biopsy was performed, and histopathological analysis confirmed a neoplastic epithelial malignancy exhibiting moderate atypia, cellular pleomorphism, nuclear hyperchromasia, and frequent mitotic figures. There were signs of keratinisation, including intercellular bridges and frequent keratin pearls. The neoplasm infiltrated the lamina propria, with desmoplastic reaction and a patchy lymphoplasmacytic infiltrate. On the surface, there were verruciform areas with binucleation and paranuclear vacuoles, interpreted as koilocytic atypia.

Immunohistochemical staining demonstrated p16 positivity, corroborating the diagnosis of HPV-associated well-differentiated squamous cell carcinoma (SCC).

Further imaging via CT of the neck and thorax revealed a tumour in the right buccal mucosa, measuring approximately 42 x 14 x 27.5 mm, with potential invasion of the gingival mucosa and questionable involvement of the external maxillary cortex. Additionally, involvement of the retromolar trigone and anterior portion of the medial pterygoid muscle was noted. There was asymmetry of the tonsillar pillars and mild medialisation of the vocal cords. Cervical and submandibular lymphadenopathy were observed, but no significant vascular abnormalities were identified. A thoracic CT showed no significant mediastinal or hilar adenopathy, although the presence of chronic

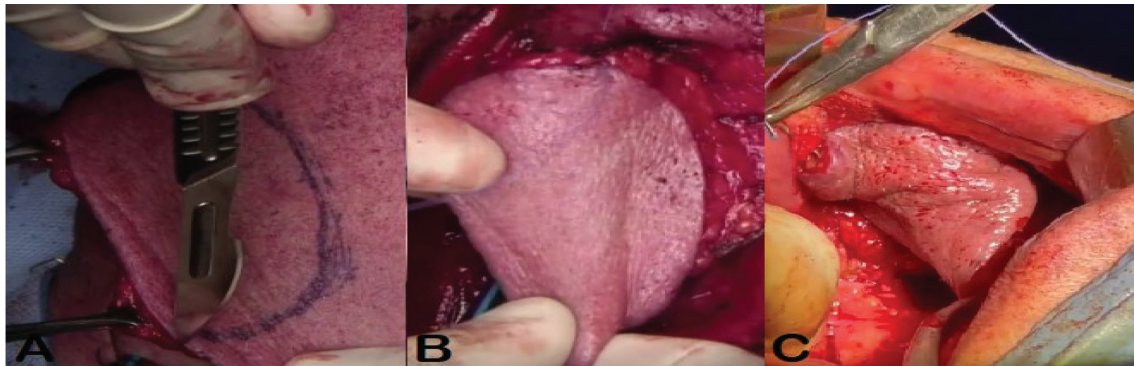


Figure 1. A: Lesion on the right buccal mucosa at diagnosis. B: Immediate postoperative view of the dermoplatysmal flap. C: Follow-up view of the dermoplatysmal flap.

fibrotic changes and bronchiectasis were noted. A previously known 40 mm aneurysmal dilation of the ascending aorta was stable, and pleural effusion was minimal. The patient had no evidence of metastatic disease.

The patient also underwent magnetic resonance imaging (MRI) to further evaluate the extent of tumour invasion. However, due to the presence of local artefacts, assessment of the oral cavity and buccal region was suboptimal. Despite this limitation, the posterior aspect of the known tumour in the right buccal mucosa was visualised, showing loss of the plane of separation from the pterygoid musculature, confirming tumour infiltration. STIR sequences demonstrated increased signal intensity and thickening of the right tonsillar pillar, associated with thinning of the parapharyngeal fat triangle, suggesting direct spread of the tumour to the tonsillar region. Post-contrast sequences, including perfusion, did not provide further useful information due to artefacts. Cervical lymph nodes were indeterminate on MRI, further necessitating physical examination and biopsy for conclusive assessment.

The patient underwent a transoral surgical excision of the tumour using a Feyh-Kastenbauer (FK) retractor (Gyrus Medical Inc, Tuttlingen, Germany) to optimise exposure of the posterior

oral cavity and retromolar trigone. Resection included wide local excision with oncological margins, followed by high-speed burr shaving of the right posterior maxillary alveolar ridge to ensure clearance of suspected bony involvement. A selective neck dissection of levels I–III was performed on the right side (selective cervical lymphadenectomy), with identification and preservation of critical neurovascular structures. For soft tissue reconstruction, a right-sided dermoplatysmal advancement flap was mobilised and rotated into the surgical defect, allowing tension-free closure and restoration of mucosal continuity. Haemostasis was meticulously secured, and layered closure was performed. The postoperative course was uneventful (Figures 1B, 1C, and 2).

Final pathology described a keratinising, conventional-pattern, well-differentiated (C1) SCC, measuring 2.5 x 2.3 x 1.7 cm, situated on the right buccal mucosa near the retromolar trigone, extending to the upper gingival mucosa, with an exophytic and infiltrative growth pattern. The tumour invaded the oral mucosa, reaching the striated muscle, and displayed an infiltrative growth front with a marked inflammatory response. The worst pattern of invasion (WPOI < 5) was noted in the central axis of the tumour, where tumour microfoci were detected more than 1 mm from the

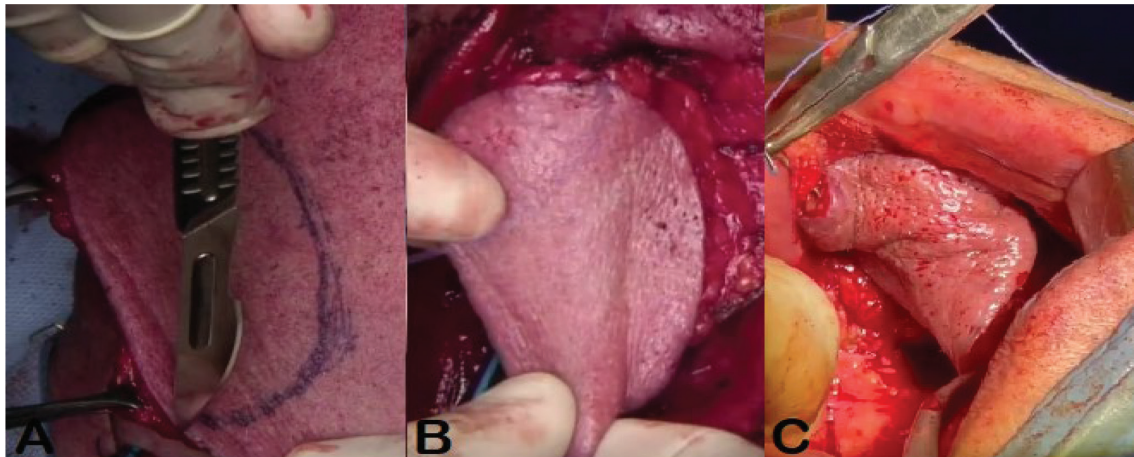


Figure 2. A: Incision with visible preoperative markings. B: Flap fully mobilised before insertion into the recipient area. C: Flap sutured after tumour excision.

main tumour mass. Foci of comedonecrosis were also present. Importantly, no evidence of lymphovascular or perineural invasion was observed. The depth of invasion (DOI) was measured at 8 mm, and the tumour was staged as pT2, pN0. Given the pathological and clinical findings, the multidisciplinary tumour board deemed that no adjuvant treatment was necessary, a decision supported by current evidence-based guidelines.

The patient's postoperative recovery was favourable. He was closely monitored in follow-up consultations every six months. At one and a half years after surgery, the patient remains free of recurrence, with no signs of local or regional disease on clinical or radiological evaluation (Figure 1C). The ongoing follow-up aims to ensure early detection of any potential recurrence, which is crucial in cases of head and neck cancers.

DISCUSSION

Squamous cell carcinoma (SCC) of the oral cavity is among the most prevalent malignancies of the head and neck, particularly in the elderly population [1]. Its clinical course is often marked

by significant morbidity due to local tissue invasion and the potential for regional and distant metastasis [1, 2]. A subset of these tumours is associated with high-risk human papillomavirus (HPV), especially HPV-16, which is known to confer a more favourable prognosis due to enhanced treatment responsiveness [1].

Histopathological findings such as keratinisation, koilocytic atypia, and overexpression of p16—a reliable surrogate marker for transcriptionally active HPV—support the diagnosis of HPV-related SCC. These features are typically associated with a well-differentiated tumour phenotype and may correlate with improved clinical outcomes. Nonetheless, in this case, the extensive local infiltration involving the retromolar trigone and the pterygoid musculature underscores the aggressive behaviour of the neoplasm despite its HPV-positive status [3].

Imaging modalities, particularly CT and MRI, are indispensable for accurate staging and surgical planning in oral SCC. In the present case, CT revealed a sizeable lesion with probable invasion of the maxillary cortex and surrounding musculature. MRI, although limited by local artefacts,

confirmed infiltration into the pterygoid muscles and suggested involvement of adjacent anatomical compartments. Fortunately, there was no radiological evidence of major vascular invasion or distant metastasis, which favoured a surgical approach [4].

Reconstruction following oncologic resection of the oral cavity remains a critical step in restoring form and function [1-3]. The platysma myocutaneous flap (PMF) has re-emerged as a valuable reconstructive option, particularly in elderly or medically compromised patients where microvascular techniques may not be ideal. Humne et al. conducted a prospective study involving 30 patients treated with PMF reconstruction, demonstrating its versatility, low donor site morbidity, and acceptable complication profile—namely infection (26.7 %), flap dehiscence (16.7 %), and necrosis (6.77 %) [1]. In our case, postoperative recovery was uneventful, and the patient remained free of recurrence at 18 months, further supporting the reliability and efficacy of PMF in this context.

A broader retrospective series by Joshi et al., analysing 104 reconstructions with various local flaps, also included PMF in a minority (3.8 %) of cases, with good functional outcomes reported across subsites, including the buccal mucosa [3]. While the use of the FK (Feyh-Kastenbauer) retractor to facilitate transoral exposure is not specifically mentioned in these studies, our experience suggests it enhances surgical access and complements the use of PMF in confined oral spaces.

Additionally, Sahni et al. highlighted the cosmetic and functional advantages of PMF, especially its concealed donor site and ease of harvest [2]. In their cohort of 10 patients, only one case of total flap loss was reported, and most complications were minor and managed conservatively. These findings align closely with our experience, where the dermoplatysmal flap provided reliable soft tissue coverage, supported healing, and minimized functional deficits in the postoperative period [2-5].

Importantly, the multidisciplinary tumour board opted against adjuvant therapy based on

a comprehensive assessment of pathological and clinical risk factors. The tumour was staged as pT2, pN0, with a depth of invasion of 8 mm, no perineural or lymphovascular invasion, and negative surgical margins. Although the tumour exhibited an infiltrative front and microfoci extending over 1 mm from the main mass (WPOI < 5), there was no extranodal extension or involvement of critical structures warranting adjuvant radiotherapy. The HPV-positive status—associated with enhanced radiosensitivity and improved prognosis—further reinforced a conservative approach [2, 3]. Thus, the decision to forego postoperative radiotherapy was consistent with current evidence-based guidelines and aligns with the principle of treatment de-intensification in selected low- to intermediate-risk HPV-related oral cavity cancers [1-5].

Finally, this case underscores the importance of comprehensive preoperative imaging despite technical limitations, as well as thoughtful flap selection tailored to tumour extent, patient comorbidities, and surgical expertise. The favourable oncological and functional outcomes observed reaffirm the role of the PMF as a valid alternative to free tissue transfer in selected oral cavity reconstructions.

CONCLUSIONS

This case underscores the intricate management of HPV-positive, well-differentiated SCC of the buccal mucosa, particularly in elderly patients. Despite the presence of extensive local invasion, surgical resection with clear margins remains the optimal treatment strategy. The use of advanced imaging techniques such as CT and MRI is crucial for assessing tumour extension and planning appropriate surgical interventions. Postoperative care, including reconstructive techniques, plays a vital role in preserving function and ensuring optimal recovery. Long-term surveillance for recurrence and metastasis is critical due to the high risk of local invasion and lymphatic dissemination.

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