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ORIGINAL ARTICLE

**Comparison of long-term functional results between standard supracricoid laryngectomy and modified technique with sternohyoid muscle<sup>☆,☆☆</sup>**

Selçuk Güneş<sup>a,b,\*</sup>, Kadir Serkan Orhan<sup>a</sup>, Bora Başaran<sup>a</sup>, Mehmet Çelik<sup>a</sup>, Erkan Kiyak<sup>a</sup>

<sup>a</sup> Istanbul University, Faculty of Medicine, Department of Otolaryngology Head and Neck Surgery, Istanbul, Turkey

<sup>b</sup> Bakırköy Dr Sadi Konuk Research and Teaching Hospital, Department of Otolaryngology Head and Neck Surgery, Istanbul, Turkey

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**KEYWORDS**

Modified supracricoid laryngectomy;  
Cancer;  
Larynx;  
Voice quality;  
Decanulation

**Abstract**

**Introduction:** Laryngeal cancer is the most common cancer of the upper respiratory tract. The main methods of treatment included surgery (partial laryngectomy and total laryngectomy) and radiation therapy. Laryngeal dysfunction is seen after both treatment modalities.

**Objective:** The aim of the study is to compare postoperative functional results of the standard supracricoid partial laryngectomy technique and a modified supracricoid partial laryngectomy technique using the sternohyoid muscle.

**Methods:** In total, 29 male patients (average years  $58.20 \pm 9.00$  years; range 41–79 years) with laryngeal squamous cell carcinoma who underwent supra cricoid partial laryngectomy were included. The patients were divided into two groups in terms of the surgical techniques. In Group A, all patients underwent standard supracricoid partial laryngectomy technique between January 2007 and November 2011. In Group B, all patients underwent modified supracricoid partial laryngectomy between August 2010 and November 2011. Fiberoptic endoscopic evaluation of swallowing test, short version of the voice handicap index scores, and the MD Anderson dysphagia inventory, the time of oral feeding and the decanulation of the patients after surgery of each groups were compared.

**Results:** The mean maximum phonation time was  $8.68 \pm 4.21$  s in Group A and  $15.24 \pm 6.16$  s in Group B ( $p > 0.05$ ). The S/Z (s/s) ratio was  $1.23 \pm 0.35$  in Group A and  $1.08 \pm 0.26$  in Group B ( $p > 0.05$ ); the voice handicap index averages were  $9.86 \pm 4.77$  in Group A and  $12.42 \pm 12.54$  in Group B ( $p > 0.05$ ); the fiberoptic endoscopic evaluation of swallowing test averages were

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\* Corresponding author.

E-mail: [drselcukgunes@gmail.com](mailto:drselcukgunes@gmail.com) (S. Güneş).

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calculated as  $12.73 \pm 3.08$  in Group A and  $13.64 \pm 1.49$  in Group B ( $p > 0.05$ ). In the MD Anderson dysphagia inventory, evaluation of swallowing, the emotional, physical, and functional scores were  $29.21 \pm 4.11$ ,  $32.21 \pm 6.85$ , and  $20.14 \pm 2.17$  in the Group B, and  $29.20 \pm 2.54$ ,  $32.4 \pm 4.79$ , and  $19 \pm 1.92$  in Group A, respectively.

**Conclusion:** Although there is no statistical difference in functional outcome comparisons, if rules are adhered to in preoperative patient selection, modified supracricoid partial laryngectomy can be applied safely and meaningful gains can be achieved in functional outcomes.

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## PALAVRAS-CHAVE

Laringectomia supracracoide modificada; Câncer; Laringe; Qualidade de voz; Decanulação

## Comparação de resultados funcionais a longo prazo entre laringectomia padrão supracracoide e técnica modificada com músculo esterno-hioideo

### Resumo

**Introdução:** O câncer laríngeo é o câncer mais comum do trato respiratório superior. Os principais métodos de tratamento incluem cirurgia (laringectomia parcial e laringectomia total) e radioterapia. A disfunção laríngea é observada em ambas as modalidades de tratamento.

**Objetivos:** O objetivo do estudo foi comparar os resultados funcionais pós-operatórios da técnica de laringectomia padrão supracracoide e a técnica de laringectomia supracracoide modificada utilizando o músculo esterno-hioideo.

**Método:** No total, foram incluídos 29 pacientes do sexo masculino (média de  $58,20 \pm 9,00$  anos, intervalo de 41 a 79 anos) com carcinoma espinocelular de laringe submetidos à laringectomia supracracoide parcial. Os pacientes foram divididos em dois grupos em termos de técnicas cirúrgicas. Todos os pacientes do Grupo A foram submetidos à laringectomia padrão supracracoide entre janeiro de 2007 e novembro de 2011. No Grupo B, todos os pacientes foram submetidos à laringectomia supracracoide modificada entre agosto de 2010 e novembro de 2011. A avaliação endoscópica da deglutição por fibra ótica, os escores da versão curta do voice handicap index e do MD Anderson dysphagia inventory, o tempo de alimentação oral e a decanulação dos pacientes foram comparados após a cirurgia em cada grupo.

**Resultados:** A média do tempo máximo de fonação foi de  $8,68 \pm 4,21$  segundos no Grupo A e  $15,24 \pm 6,16$  segundos no Grupo B ( $p > 0,05$ ). A razão S / Z (seg/seg) foi de  $1,23 \pm 0,35$  no Grupo A e  $1,08 \pm 0,26$  no Grupo B ( $p > 0,05$ ); as médias do voice handicap index foram  $9,86 \pm 4,77$  no Grupo A e  $12,42 \pm 12,54$  no Grupo B ( $p > 0,05$ ); as médias da avaliação endoscópica da deglutição por fibra ótica foram calculadas como  $12,73 \pm 3,08$  no Grupo A e  $13,64 \pm 1,49$  no Grupo B ( $p > 0,05$ ). Na avaliação da deglutição pelo MD Anderson dysphagia inventory, os escores emocional, físico e funcional foram  $29,21 \pm 4,11$ ,  $32,21 \pm 6,85$  e  $20,14 \pm 2,17$  no Grupo B e  $29,20 \pm 2,54$ ,  $32,4 \pm 4,79$  e  $19 \pm 1,92$  no Grupo A, respectivamente.

**Conclusão:** Embora não haja diferença estatística nas comparações de resultados funcionais, se as regras forem respeitadas na seleção pré-operatória do paciente, a laringectomia supracracoide parcial modificada pode ser aplicada com segurança e ganhos significativos podem ser alcançados em termos de resultados funcionais.

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## Introduction

Laryngeal cancer is the most common cancer of the upper respiratory tract. The main methods of treatment include surgery (partial laryngectomy and total laryngectomy) and radiation therapy. Laryngeal dysfunction is a consequence of both treatment modalities. Partial laryngectomies afford preservation of three main functions of the larynx; swallowing, respiration and phonation. Different horizontal partial laryngectomy modalities (supracricoid laryngectomy

or supraglottic laryngectomy) and reconstruction techniques are used depending on tumor extension.<sup>1-5</sup>

Supracricoid partial laryngectomy (SCPL), which is an alternative technique to total laryngectomy, was first described by Meyer and Rieder in 1959.<sup>1</sup> The aim of this technique is to remove the tumor without using permanent tracheostomy and to preserve swallowing and speech functions.<sup>2,3</sup>

SCPL could be performed both in supraglottic tumors with limited thyroid cartilage invasion, lack of vocal cord

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