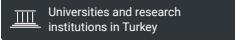


## EurAsian Journal of BioSciences

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
Turkey 	Agricultural and Biological Sciences └ Agricultural and Biological Sciences (miscellaneous)  Biochemistry, Genetics and Molecular Biology └ Biochemistry, Genetics and Molecular Biology (miscellaneous)  Environmental Science └ Environmental Science (miscellaneous)	Foundation for Environmental Protection and Research	<b>12</b>
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Journals	13079867	2013-2020	<a href="#">Homepage</a> <a href="#">How to publish in this journal</a> <a href="mailto:ejobios@ejobios.org">ejobios@ejobios.org</a>

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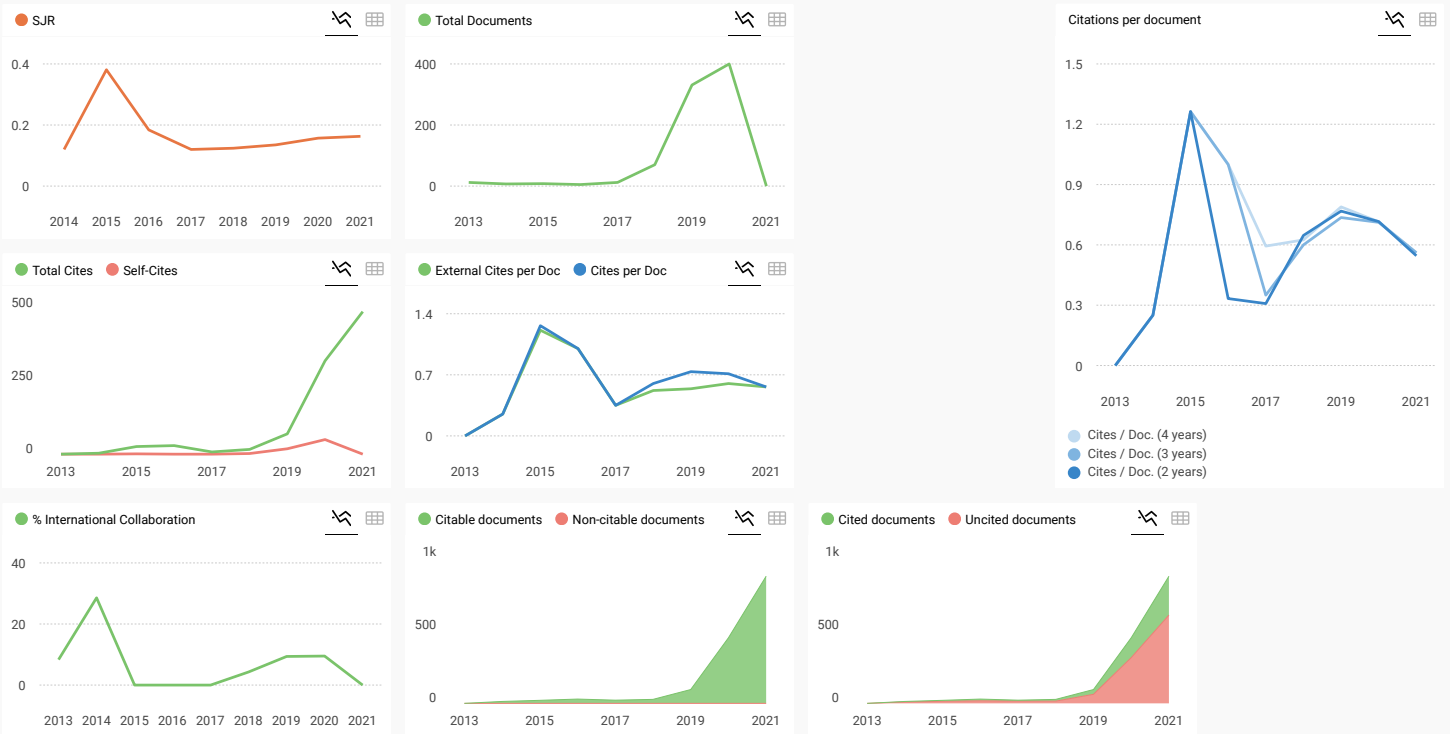
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**Z** **Ziad** 2 weeks ago

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I have published an article in your magazine (Alabdallah, A. Z., et al. "Histological and morphometric characteristics of chicken embryos with different genotypes." EurAsian Journal of BioSciences 14.1 (2020): 719-725). So far, it has not been included in Scopus data, but you are from me.

with due respect

reply

**Melanie Ortiz** 2 weeks ago

SCImago Team

Dear Ziad,  
 thank you very much for your comment. We suggest you contact Scopus support team:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
 Best Regards, SCImago Team

**M** **Mamdoh M Meqdam** 4 months ago

Pls. send me

Instructions to Authors / EurAsian Journal of Biosciences

reply

**Melanie Ortiz** 4 months ago

SCImago Team

Dear Mamdoh, thank you very much for your comment, we suggest you look for the author's instructions/submission guidelines in the journal's website. Best Regards,  
 SCImago Team

N

**nourah m** 5 months ago

hi  
i need the Editorial board of Eurasian Journal of Biosciences  
thank you

[reply](#)**Melanie Ortiz** 5 months ago

SCImago Team

Dear Nourah,  
Thank you for contacting us. Please see comments below.  
Best Regards, SCImago Team

R

**Ramadan** 5 months ago

Dear  
Greetings  
Please I need to know the editors of the journal Eurasian Journal of Biosciences  
All the best  
Dr. Ramadan

[reply](#)**Melanie Ortiz** 5 months ago

SCImago Team

Dear Ramadan,  
Thank you for contacting us.  
We suggest you visit the journal's homepage.  
Best Regards, SCImago Team

N

**Ndoc Vata** 6 months ago

In the Vol.14, year 2020 I was publishing an article (Evolution of soil surface nutrient balance in arable land of Albania).  
In the meantime I am in a promotion phase, and searching under Scopus I can't find my article.  
Please, can you help me to resolve this problem, since this is a serious one for me.

[reply](#)

N

**Ndoc Vata** 6 months ago

Dear Mrs./Mr. Editor,  
I am dissatisfied with the answer you sent me. I only know you as publisher body, where I published my article to appear in Scopus, as I am required by the institution for academic qualification purposes. For this I paid you 298.5 Euros (Total 317.5 Euros), for the item to appear on Scopus. Therefore, I am asking you once again to contact Scopus to get my article out there. Otherwise, I reserve the right to publicly denounce you for fraud.  
Waiting for your reply.

**Melanie Ortiz** 6 months ago

SCImago Team

Dear Ndoc,  
Thank you for contacting us again.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. For this reason, we suggest you contact the journal's editorial staff, so they could help you.  
Best Regards, SCImago Team

**Melanie Ortiz** 6 months ago

SCImago Team

Dear Ndoc,  
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support team: [https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

A

**Aws Ibrahim Sulaiman** 7 months ago

my research published in EurAsian Journal of BioSciences in volume 14 (2): 2020  
in titled The antibacterial effect of Frankincense and apple vinegar against Klebsiella spp. isolated from UTI patients  
but for now not found in Scopus preview

← reply



**Melanie Ortiz** 7 months ago

SCImago Team

Dear Aws Ibrahim,  
thank you very much for your comment. We suggest you contact Scopus support team:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team



**Mariam Alla Tuma** 1 year ago

Good day  
may I know how long time from submitting a paper to get an acceptance letter? and how much the publication fee? Can you tell me if this journal (EurAsian Journal of BioSciences) was in Scopus or not.  
Thanks

← reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Mariam,  
Thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day. For further information about this journal, please visit the journal's website or contact directly with the editorial staff.  
Best Regards, SCImago Team



**Mutaz** 1 year ago

Dears  
Can you tell me if this journal (EurAsian Journal of BioSciences) was in Scopus or not.

Regards

← reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Mutaz,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
Best Regards, SCImago Team



**H.s** 2 years ago

I had received acceptance letter to publish my paper in January of this year, but till now the journal didn't publish it. Why?  
Plz help us  
It is our article title  
((Evaluate the Surgical and Orthodontic Treatments in Children with Sleeping Breathing Disorder: A Systematic Review and Meta-Analysis ))

← reply



**shaymaa** 2 years ago

please how much the fee?????



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Dr.Shaymaa,  
thank you for contacting us.  
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

S

**sarah** 2 years ago

hi, how can i publish in your journal? and is there a template format to follow?  
thanks in advance

reply



**Buthaina** 2 years ago

Hello all,  
I had received acceptance letter to publish my paper in February of this year, but till now the journal didn't publish it. Is there a problem with this journal and is it still in scopus



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Buthaina, thank you very much for your comment. We suggest you consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.  
Best Regards, SCImago Team

S

**Sarah** 2 years ago

I tried opening the option "how to publish in this journal", but the option does not open



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sarah,  
thank you very much for your comment, we suggest you look for the author's instructions/submission guidelines in the journal's website.  
Best Regards, SCImago Team

M

**Moatasem Alsalih** 2 years ago

Greetings and Regards

An article titled

Evaluation of cellular oxidative stress levels in aedes aegypti mosquitoes as a reaction of photo catalyst modify nanoparticles exposure

published in

EurAsian Journal of BioSciences

in date 2020/9/29

why still out side Scopus database

please if you can consider this article in Scopus database as soon as and inform the correspondence author

at last please accept my true and best regards

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Moatasem,  
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support: [https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

A

**Abeer Thaher Naji AL-Hasnawi** 2 years ago

I published a research paper in your wonderful journal under the title (Role of interleukin 25 and interleukin 33 as immunological markers in pediatric asthma), and it has not been released yet in the author profile of Scopus preview, knowing that this research is dependent on my scientific promotion. Please add it quickly to the Scopus preview, with best regards.

reply



shahzad 2 years ago

I also face the same problem and I contact the scopus and they said this journal is delisted now. It's very sad that the scopus listed journal in 2020 and yet our paper not included



Melanie Ortiz 2 years ago

SCImago Team

Dear Abeer,  
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support: [https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team



NAYYEF ALMALIKI 2 years ago

Dear sir  
Why this journal announced it ceased publication. Is it still in Scopus.

reply



Shaimaa 2 years ago

It is not, its out now



Melanie Ortiz 2 years ago

SCImago Team

Dear Shaimaa,  
thank you for contacting us. Could you please send the source of that information?  
Best Regards, SCImago Team



Melanie Ortiz 2 years ago

SCImago Team

Dear Nayyef,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day. For further information about this journal, please visit the journal's website or contact directly with the editorial staff.  
Best Regards, SCImago Team



Thamer Hameed Reja 2 years ago

Hello all,  
Hope this finds you well, I have published research paper in Eurasia J Biosci 14, 4689-4695 (2020), and when I contact scopus to add my research paper on scopus database, I have been informed that the journal is currently being investigated to add any content and when open journal home page i found phrase (has ceased publishing, i appreciate if you assist me.and that the message from scopus  
(Dear Thamer Al-Falahy,

Thank you for contacting Scopus regarding article: Impact of potassium sulphate and naphthalene acetic acid spray on yield and fruit quality of date palm cv. Barhee

Sorry for the inconvenience caused. Unfortunately, The journal "EurAsian Journal of BioSciences" is currently being investigated to add any content further which will take approximately 2 months for the decision to be taken.

Hence I would request you to contact us after 2 months to assist you further.

Meanwhile, please let me know in case of any other assistance.

Thank you for your patience and understanding.

Kind Regards,  
Sowkya.S  
Content Service Desk  
ELSEVIER

reply



Melanie Ortiz 2 years ago

SCImago Team

Dear Thamer,

Thank you for contacting us. Could you please expand a little bit on your request to SCImago?  
Best Regards, SCImago Team

**T** **Thamer Hameed Reja** 2 years ago

Dear sir  
I have an inquiry, why the Journal has ceased publication??

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Thamer,  
Thank you for contacting us. Could you please expand a little bit on your comment?  
Best Regards, SCImago Team

**A** **A.alghamdi** 2 years ago

Good morning staff of EurAsian Journal of BioSciences  
we sent the manuscript to the journal, after that one person ( Mrs Tatiana Belova/ support manager/ ORES Platform) told me the manuscript was accepted but he asked me 420\$ (USA), but some things is not clear. please help me.do you know Mrs Tatiana Belova? or you have any information ?

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear A.Alghamdi,  
thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

**A** **A almusawi** 2 years ago

Dear Melanie Ortiz,  
I would like to ask you about some journals didn't have a homepage on the Scopus website, but have a homepage in your site?

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir,  
  
Thank you for contacting us. As you can see in our website, SCImago provides information about the Scope, Homepage, Url for submitting an article and Contact details of the Journals. This information is an extra tool to facilitate the communication between the authors and the journal to make accessibility easier.

Best Regards, SCImago Team

**N** **noor** 2 years ago

how much the fee of publication

and the date od publication ??

reply



**Teacher** 2 years ago

400 dollars



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Noor,  
thank you for contacting us.

We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

E

**eman sameer** 3 years ago

مرحبا ..... احب اسأل كيف النشر في مجلتكم وكم اسعار النشر  
عندي بحث اريد انشره في مجلتكم ماهي خطوات النشر  
شكرا جزيلاً

reply

S

**sathish** 3 years ago

it is Scopus index now also ? and what is the cost?



**Melanie Ortiz** 3 years ago

SCImago Team

Dear Sathish, thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you to consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day. For further information about this journal, please visit the journal's website. Best Regards, SCImago Team



**Melanie Ortiz** 3 years ago

SCImago Team

Dear Eman,  
thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage (See submission/author guidelines) or contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

A

**Ahmed Khudhair** 3 years ago

What is the classification of this journal i mean Q2 or Q2 or Q3 or Q4... Thank you

reply



**Melanie Ortiz** 3 years ago

SCImago Team

Dear Ahmed, thank you very much for your request. You can consult that information in SJR website. Best Regards, SCImago Team

M

**MUNA** 3 years ago

Good day  
may I know how long time from submitting a paper to get an acceptance letter? and how much the publication fee?  
Thanks

reply



**Melanie Ortiz** 3 years ago

SCImago Team

Dear Muna,  
thank you for contacting us.  
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

J

**Jwan** 3 years ago

Good morning staff of EurAsian Journal of BioSciences  
we sent the manuscript to the journal, after that one person ( Mrs Tatiana Belova/ support



manager/ ORES Platform) told me the manuscript was accepted but he asked me 420\$ (USA), but some things is not clear. please help me.do you know Mrs Tatiana Belova? or you have any information ?

please help me

thanks for response

best regards

↩ reply

W

**Widya** 2 years ago

Hi sir, how your publication in this journal? How publication fee?



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Widya,  
thank you for contacting us.  
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

R

**Raad M. Wafur Abdulrazzaq** 3 years ago

Hi

please, can you answer me how can i find my published research, because i was searching in you Journal issue 13 ,2, pages 695 to 700 (2019) i was find another paper in the same pages(not my) and there is no issue 13, just issue 13,1,2 from Jan.to Dec.2019(no. 2 still in progress),please you can see the attachment file

with my sending message to you,please tell me.Thanks

best regards

prof.Dr.Raad M.Wafur Abdulrazzaq

raadalsadon@yahoo.com

↩ reply



**Melanie Ortiz** 3 years ago

SCImago Team

Dear Raad,  
thank you for contacting us.  
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you to contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

A

**azim ahmadi** 4 years ago

Greetings and Regards

An article titled

Evaluation of stress tolerance indexes with morpho-physiological traits in a number of advanced genotypes of lentil (*Lens culinaris*) under rainfed and low irrigation conditions

I've been sent for 2 months ago

Thank you if you accept

With respect

azim ahmadi

↩ reply



**Elena Corera** 4 years ago

SCImago Team

Please, contact EurAsian Journal of BioSciences, you are contacting Scimago Journal and Country Rank.

Best,

SCImago Team

F

**Fatemeh Sistani** 4 years ago

Hello, Could you explain about this journal that is an ISI journal please?

← reply



**Elena Corera** 4 years ago

SCImago Team

Dear Fatemeh, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

G

**Ghorbani** 4 years ago

Hi Dear  
Is this journal ISI?  
Thanks a lot.

← reply

G

**Ghorbani** 4 years ago

Hi Dear  
Is this journal ISI indexed?  
Thanks.

← reply



**Elena Corera** 4 years ago

SCImago Team

Dear Ghorbani, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

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## Risk factors of pharyngocutaneous fistula following total laryngectomy

Andhika Maharani<sup>1</sup>, Muhtarum Yusuf<sup>1\*</sup>

<sup>1</sup> Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine-Dr. Soetomo Teaching Hospital, Universitas Airlangga, Surabaya 60131, INDONESIA

\*Corresponding author: [muhtarumyusuf@yahoo.co.id](mailto:muhtarumyusuf@yahoo.co.id)

### Abstract

**Background:** Total laryngectomy is the procedure of removing the entire laryngeal structure. The purpose of this study was to analyze the risk factors for postoperative total pharyngocutaneous fistula.

**Methods:** This was a retrospective study using medical record data with cross-sectional design. This research was conducted at Dr. Soetomo Surabaya, Indonesia from January 1, 2016 to December 31, 2018.

**Results:** The prevalence of pharyngocutaneous fistula was 14 patients (17.07%) of 82 patients with laryngeal carcinoma. Age factors ( $p = 0.243$ ), sex ( $p = 1.000$ ), previous smoking history ( $p = 0.506$ ), history of type 2 diabetes mellitus ( $p = 1.000$ ), histopathology ( $p = 0.076$ ), stage ( $p = 1.000$ ), tumor location ( $p = 0.183$ ), incision technique ( $p = 0.924$ ), preoperative hemoglobin levels ( $p = 0.669$ ), and preoperative albumin levels ( $p = 1.00$ ) were not found to be significantly associated with complications of pharyngocutaneous fistula. However, there was a significant relationship between neck dissection and pharyngocutaneous fistula complications ( $p = 0.023$ , OR = 6.8, 95% CI 1.373 - 33.867). Patients with neck dissection had the possibility to experience complications of pharyngocutaneous fistula 6.8 times higher compared to those without neck dissection.

**Conclusion:** There is a relationship between neck dissection and pharyngocutaneous fistula complications.

**Keywords:** total laryngectomy, pharyngocutaneous fistula, risk factors

Maharani A, Yusuf M (2020) Risk factors of pharyngocutaneous fistula following total laryngectomy. Eurasia J Biosci 14: 2501-2506.

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### INTRODUCTION

Cancer has become a global burden because of the aging, increased adoption of cancer-causing behaviors particularly smoking and exposure to triggering factors, such as chemicals, radiations, unhealthy eating habits, and a sedentary lifestyle (Nasution et al. 2018). Mortality due to neoplasms remained at the second place between 1990 and 2017 (Fitzmaurice et al. 2019). Cancer also affects economic-social consequences and disability for individuals (Razak et al. 2018; Tsiring et al. 2019). Current advances in diagnosis and therapy can support cancer survivors so they can survive longer (Suhardin et al. 2016). More than half of cancer patients are treated with chemotherapy, a cancer treatment using chemicals or drugs for local cancer and metastasis (Haseeb et al., 2020). Chemotherapy is usually combined with surgery or radiotherapy (Sari et al. 2019).

One type of cancer that can cause disability is laryngeal carcinoma (Fitzmaurice et al. 2019). Laryngeal carcinoma is a malignancy in the larynx affecting the glottis, supraglottis, and subglottis (Indiyana et al. 2016). Total laryngectomy is the procedure of removing the entire laryngeal structure, starting from the upper limit of

the epiglottis and os hioid to the lower limit of the tracheal ring. Total laryngectomy is performed on residual laryngeal tumors of T3, T4 and T1/T2 stages or failure of radiation therapy (Dhingra et al. 2014). Total laryngectomy can lead to various complications, such as pharyngocutaneous fistula, flap infection, and stoma stenosis with an impact on the morbidity and quality of life of the patient. Thus, longer hospital treatment is needed (Maharjan et al. 2010, Rassekh et al. 2010, Reddy et al. 2012).

Fistula is an abnormal connection between the surfaces of two epithelium. Pharyngocutaneous fistula is the fistula track between pharyngeal mucosa and neck or cervical skin around the surgical suture or the area around the stoma due to failure of wound healing that causes salivary leakage (Luo, 2020). The prevalence of pharyngocutaneous fistulas varies between 5% to 65%. The incidence of fistulas is usually found around 4-7 days postoperatively (Nitassi et al. 2016, Sabri 2010). Some risk factors for these complications include age,

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preoperative hemoglobin levels, preoperative albumin levels, length of surgery, neck dissection, amount of bleeding, stage, tumor location, preoperative tracheotomy, skin incision techniques, and esophageal suturing techniques (Nitassi et al. 2016). Complications of total laryngectomy can increase morbidity, high costs, a longer healing period, and cause permanent disability (Shah et al., 2016). For this reason, surgical wound care plays an essential role in the process of wound healing and prevention of pharyngocutaneous fistulas (Sabri 2010). Proper treatment of cancer can make it easier for the healing process (Deliana et al. 2019). The purpose of this study was to analyze the risk factors for post-laryngectomy pharyngocutaneous fistula at Dr. Soetomo Hospital, Surabaya, from January 1, 2016 to December 31, 2018.

## METHODS

This type of research is a descriptive-analytic retrospective approach using central medical record data and One-Stop Oncology Polyclinic of Dr. Soetomo Hospital, Surabaya, Indonesia with cross-sectional design. The study population was all patients with laryngeal carcinoma who had undergone total laryngectomy surgery in the Department of Otorhinolaryngology-Head and Neck Surgery, Oncology Division from January 1, 2016 to December 31, 2018. The study sample was all patients with pharyngocutaneous fistula after total laryngectomy surgery who met the inclusion criteria. Inclusion criteria were patients with a complete medical record and had never undergone preoperative chemoradiotherapy.

The data recorded included basic data in the form of gender, age. Clinical data included smoking history, history of diabetes mellitus, stage, histopathology, tumor location, skin incision technique, neck dissection. Laboratory data included preoperative hemoglobin levels, preoperative albumin levels. Data obtained in this study were then performed statistical tests to determine the relationship of risk factors with pharyngocutaneous fistula using Chi-square, Kruskal-Wallis, Mann Whitney, and Fisher Exact. If there is a significance value ( $p$ )  $<0.05$ , it is followed by a multivariate logistic regression test to test whether the probability of a pharyngocutaneous fistula can be predicted from risk factors.

Ethical clearance was approved by the Research Ethics Committee for the Research and Development Sector of Dr. Soetomo Hospital, Surabaya, in October 2019.

## RESULTS

From January 1, 2016 to December 31, 2018, there were 82 patients with laryngeal carcinoma who underwent total laryngectomy surgery. However, only 61 patients had complete medical record data and had not

received chemoradiotherapy. The prevalence of pharyngocutaneous fistula was 14 patients (17.07%) of 82 patients with laryngeal carcinoma, while non-fistula was 47 patients (57.31%).

**Table 1** presents that age ( $p = 0.243$ ), sex ( $p = 1.000$ ), previous smoking history ( $p = 0.506$ ), history of type 2 diabetes ( $p = 1.000$ ), histopathology ( $p = 0.076$ ), stage ( $p = 1.000$ ), tumor location ( $p = 0.183$ ), incision technique ( $p = 0.924$ ), preoperative hemoglobin levels ( $p = 0.669$ ), and preoperative albumin levels ( $p = 1.00$ ) did not show a significant relationship with complications of pharyngocutaneous fistula. However, a significant relationship was found between neck dissection and pharyngocutaneous fistula complications ( $p = 0.023$ , OR = 6.8, 95% CI 1.373 - 33.867). Patients with neck dissection had the possibility to experience complications of pharyngocutaneous fistula 6.8 times higher compared to those without get neck dissection (Sittisom, 2020). OR  $>1$  can also be concluded that neck dissection increases the risk of fistula complications.

## DISCUSSION

Risk factors investigated in this study included age, sex, smoking history, history of diabetes mellitus, histopathology, stage, location of tumor, skin incision technique, preoperative hemoglobin level, preoperative albumin level, and neck dissection. The results showed that only risk factors for neck dissection have a significant relationship with the onset of complications of post-laryngectomy pharyngocutaneous fistula. Meanwhile, other researchers observed several risk factors, such as preoperative tracheotomy, esophageal suturing techniques, and history of preoperative radiotherapy with varied variable results (Cecatto et al. 2014, Nitassi et al. 2016, Sabri 2010; Chang, & Kim, 2018).

This study shows that neck dissection has a significant relationship with pharyngocutaneous fistula complications. This is in accordance with previous studies revealing that the incidence of fistula increased by 11.3% -17.5% during total laryngectomy surgery accompanied by neck dissection (Qureshi et al. 2005). Other studies have also found neck dissection as a risk factor for pharyngocutaneous fistula complications in total laryngectomy accompanied by bilateral neck dissection compared to unilateral neck dissection or no dissection. Neck dissection can lead to a longer duration of surgery, wider tissue defects, reduced normal residual mucosa and disrupt blood flow and lymphatic system circulation (Basheeth et al. 2014). Large tumors (T3 or T4), neck dissection and, partial resection of the pharyngeal wall during surgery may be needed, making pharyngeal closure difficult. Large surgical wound defects also cause tissue pressure and will reduce microcirculation (Jefferson 2014). If the remaining pharyngeal mucosa is insufficient for closure, the risk of

**Table 1.** Description and analysis of risk factors

Characteristics	Fistula		p
	No (n= 47) n (%)	Yes (n = 14) n (%)	
Age (year) <sup>a</sup>	56.38±11.43	52.36±12.06	0.243
Sex <sup>b</sup>			
Male	42 (89.36)	13 (92.86)	1.000
Female	5 (10.63)	1 (7.14)	
Smoking <sup>b</sup>			
No	12 (25.53)	5 (35.71)	0.506
Yes	35 (74.47)	9 (64.29)	
Diabetes Mellitus <sup>b</sup>			
No	43 (91.49)	13 (92.86)	1.000
Yes	4 (8.51)	1 (7.14)	
Histopathology <sup>c</sup>			
SCC Keratin invasive	0 (0)	2 (14.29)	0.076
SCC is well differentiated	23 (48.94)	6 (42.86)	
SCC is moderately differentiated	19 (40.43)	5 (35.71)	
SCC is poorly differentiated	5 (10.64)	1 (7.14)	
Stages <sup>b</sup>			
3	5 (10.64)	1 (7.14)	1.000
4	42 (89.36)	13 (92.86)	
Location of Tumor <sup>c</sup>			
Supraglottis	4 (8.51)	0 (0)	0.183
Supraglottis-glottis	16 (34.04)	2 (14.29)	
Supraglottis-subglottis	14 (29.79)	4 (28.57)	
Glottis	8 (17.02)	4 (28.57)	
Glottis-subglottis	5 (10.64)	3 (21.43)	
Subglottis	0 (0)	1 (7.14)	
Skin Incision Techniques <sup>d</sup>			
U incision	45 (95.74)	14 (100)	0.924
Y incision	2 (4.26)	0 (0)	
Pre-opb Hb <sup>d</sup>			
<11.5 mg/dl	22 (46.81)	5 (35.71)	0.669
≥11.5 mg/dl	25 (53.19)	9 (64.29)	
Pre-op albumin <sup>d</sup>			
<3.5 mg/dl	18 (38.30)	5 (35.71)	1.000
≥ 3.5 mg/dl	29 (61.70)	9 (64.29)	
Neck Dissection <sup>d</sup>			
No	25 (53.19)	2 (14.29)	0.023
Yes	22 (46.81)	12 (85.71)	

SCC: squamous cell carcinomas a: Mann Whitney; b: Fisher exact; c: Kruskal wallis; d: Chi-square

defects around the wound suture and healing process will increase (Papazoglou et al. 1994). This is in contrast to some studies with a total sample of 2200 from review articles showing that neck dissection had no significant relationship with pharyngocutaneous fistulas (Cecatto et al. 2014).

Neck dissection often done in this study was radical modification of type 2 and type 3 neck dissection, a procedure performed by performing neck dissection of lymph node tissue on one side of the neck (level I to V) raised to enbloc, maintaining the accessory nerve and jugular veins internal (type 2), and accompanied by maintenance of the structure of the sternocleidomastoid muscle for type 3 (Medina 2014). Also, patients undergo laryngectomy surgery (with or without neck dissection) then receive chemoradiotherapy due to the queue on chemotherapy and radiotherapy itself. Thus, most total laryngectomy operations accompanied by neck dissection aim to eliminate primary carcinoma metastasis in the larynx and prevent a recurrence. This is different if radiotherapy is done before laryngectomy surgery because of a good neck mass response so that it can be considered about the decision to do neck dissection.

Other risk factors in this study that statistically did not have a significant relationship with the emergence of pharyngocutaneous fistula complications were age, sex, smoking history, history of diabetes mellitus, histopathology, staging, tumor location, skin incision techniques, preoperative hemoglobin levels, preoperative albumin levels and duration of the operation. This study did not involve patients undergoing chemoradiotherapy before total laryngectomy surgery was performed because of the long queues at the radiotherapy department of Dr. Soetomo Hospital. Thus, all samples of this study received operative therapy first then chemoradiotherapy. Preoperative radiotherapy is a risk factor for pharyngocutaneous fistula. In the initial phase, during radiotherapy, cells divide and die regularly and quickly, causing acute toxic effects such as dermatitis or mucositis. The second or subsequent phase, injury to cells due to the effects of radiotherapy, is a microvascular tissue disorder, such as subintimal fibrosis, endarteritis, and thrombus formation. This results in tissue becoming hypovascular, hypocellular, and hypoxic. This radiotherapy effect can last 6 months, even during the patient's life. Thus, if total laryngectomy is performed, it will disrupt the wound healing process,



and ultimately increase the risk of postoperative complications (Paydarfar et al. 2006).

Symptoms that appear if a post-laryngectomy total fistula is formed is the flow of saliva or food through the sidelines of the surgical wound suture. Examination by pressing the area around the suspected fistula results in the appearance of the saliva flow. Experts argue that delaying oral feeding will reduce the incidence of fistula. This is because the stress level of esophageal sutures after total laryngectomy is much reduced. Delay oral feeding by providing nutrition through a nasogastric tube (NGT), maintained for 7-10 days after total laryngectomy to prevent fistula. Postoperative vomiting can trigger damage to the esophageal suture, while postoperative patients often experience nausea due to anesthesia. Therefore, the administration of anti-emetic injection drugs (metoclopramide) and gastric drugs (ranitidine) is needed for the initial three days after surgery (Qureshi et al. 2005). Fever on the first postoperative day is prognostic in the development of fistula. Some studies find a high correlation between fever that develops in the first 48 hours and fistula formation. Thus, early intervention (before the third postoperative day) decreases morbidity and duration of hospitalization (Galli et al. 2005).

Surgical wound care plays an important role in the process of wound healing and prevention of pharyngocutaneous fistulas. The drain hose must be observed every 8 hours to ensure it works well to prevent the formation of hematomas and infections. Signs of infected incision wounds that must be considered, such as redness, urine, and wet. Good postoperative oral hygiene is very important to control infection and prevent bad breath. Pharyngocutaneous fistulas can occur in the area of the surgical incision, most often in the first week after surgery. Per its location, pharyngocutaneous and orocutaneous fistulas are the most common fistulas in patients with extensive resection (Irfandy et al. 2015, Sabri 2010).

Based on the way of healing, pharyngocutaneous fistula can be divided into two groups. The first group is

small fistulas that can heal spontaneously with the treatment of intensive wounds. Administration of antibiotics, septic wound closure, minimal debridement, and feeding through nasogastric tubes with surveillance of nutritional status in patients allow secondary fistula healing within a month or more. The second group is a large fistula characterized by the extent of the skin over the fistula lost and delicate from the mucosa (Myers 2008). The remaining tumor and the possibility of recurrence need to be considered when the fistula does not close secondary. Large fistulas can close through secondary healing, but in cases of exposure to major blood vessels, surgical procedures with a flap need to be performed. Surgical closure with a flap is recommended for blood vessel protection, infection control, and facilitating postoperative adjuvant therapy (Cecatto et al. 2014).

The limitation of this study is that the cross-sectional design is challenging to assess the cause and effect relationship because the measurement of disease events and exposure to risk factors are observed at one-time point at the same time. Most of the risk factors studied are natural factors of the patient. In contrast, the emergence of pharyngocutaneous fistula complications requires the role of many factors such as suturing techniques esophagus, preoperative tracheotomy, and amount of bleeding. The study period was limited to 3 years due to limited medical record data so that the sample size was fulfilled based on period rather than on statistical calculations.

## CONCLUSION

The results obtained a significant relationship between risk factors for neck dissection with pharyngocutaneous fistula complications with an OR of 6.8. Patients with neck dissection have the possibility to experience complications of pharyngocutaneous fistula 6.8 times higher compared to those who do not get neck dissection. Meanwhile, other risk factors do not have a significant relationship with pharyngocutaneous fistulas.

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