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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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LASER RESECTION AND ENDOBRONCHIAL STENTING IN THE MANAGEMENT OF MALIGNANT CENTRAL AIRWAY OBSTRUCTION: A COMPARATIVE SURVIVAL AND QUALITY OF LIFE ANALYSIS

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Abstract.

Background: Malignant central airway obstruction (CAO) is a critical, life-limiting complication in patients with advanced thoracic malignancies. Interventions such as bronchoscopic laser resection and airway stenting can provide rapid palliation and symptom relief, yet comparative data on survival and quality of life (QoL) remain limited.

Objective: To assess the impact of bronchoscopic laser resection and stenting on survival and health-related QoL in patients with malignant CAO, compared with conservative palliative care.

Methods: A comparative cohort study was conducted at a national pulmonary referral center. Thirteen patients underwent bronchoscopic laser resection and/or endobronchial stenting, while twelve control patients received conservative palliative care. Kaplan-Meier survival analysis and Cox proportional hazards models were used to evaluate mortality. Health-related QoL was measured using the EQ-5D-5L questionnaire at baseline and one-month post-intervention.

Results: Median survival in the intervention group was 9.7 weeks compared to 0.6 weeks in the control group ($p < 0.0001$). At 25 weeks, the hazard ratio for death was 0.019 (95% CI: 0.004-0.091). The mean EQ-5D-5L score improved from 29.2 ± 14.4 to 43.5 ± 9.2 ($p = 0.0062$), with the most pronounced improvements in the pain/discomfort and anxiety/depression domains.

Conclusion: Bronchoscopic laser resection and airway stenting significantly improve short-term survival and quality of life in patients with malignant CAO. These minimally invasive interventions should be considered integral components of palliative care for patients with inoperable airway obstruction.

Key words. Laser resection, endobronchial stenting, airway obstruction.

Introduction.

Malignant central airway obstruction (CAO) is a severe and frequently fatal complication that occurs in approximately 20–40% of patients with advanced thoracic malignancies, including non-small cell lung cancer (NSCLC), small cell lung cancer, and metastatic tumors involving the tracheobronchial tree [1]. Obstruction of the central airway can lead to life-threatening respiratory symptoms such as dyspnea, stridor, hemoptysis, post-obstructive pneumonia, and respiratory failure [2,3]. These complications significantly impair patients' quality of life and are associated with increased morbidity and mortality, especially in those deemed ineligible for surgical resection.

Traditional management options for CAO in non-surgical candidates include systemic chemotherapy, radiation therapy, corticosteroids, bronchodilators, and supplemental oxygen. However, these conservative approaches often provide only limited symptomatic relief and do not directly address mechanical obstruction of the airway lumen [4]. In contrast, bronchoscopic interventions such as laser resection, mechanical debulking, and endobronchial stenting have demonstrated rapid restoration of airway patency, with improvements in gas exchange, symptom burden, and overall performance status [5].

Guidelines from both the American College of Chest Physicians (CHEST) and the European Respiratory Society (ERS) support the use of bronchoscopic procedures in patients with malignant CAO who are unsuitable for curative surgery or require emergent airway stabilization [6]. These interventions are typically performed via rigid or flexible bronchoscopy and can involve multiple modalities, including thermal laser ablation, photodynamic therapy, cryotherapy, and silicone or metallic stent deployment, depending on tumor location, extent, and airway anatomy [7,8].

While large prospective studies have validated the technical feasibility and short-term success of endobronchial stenting and tumor debulking in high-resource settings, limited evidence is available regarding their survival benefit and impact on quality of life in low- and middle-income countries (LMICs), where resource constraints may limit access to specialized interventions [9].

This study aims to evaluate the clinical effectiveness of bronchoscopic laser resection and/or airway stenting in patients with malignant CAO by comparing survival outcomes and quality of life metrics against a control group receiving conservative palliative care. Through this comparative analysis, we aim to provide additional data supporting the integration of interventional pulmonology into standard palliative care strategies for patients with inoperable airway obstruction.

Methods.

Study Design and Setting: This comparative observational study was conducted at the National Center for Tuberculosis and Lung Diseases in Tbilisi, Georgia, between January 2018 and December 2019. The objective was to compare outcomes between patients with malignant CAO who underwent bronchoscopic intervention and those receiving conservative palliative care.

Participants: Thirteen adult patients with histologically confirmed malignant CAO who underwent bronchoscopic laser resection and/or endobronchial stenting were prospectively enrolled in the intervention group. A control group of twelve

patients with similar clinical profiles who received standard palliative care was identified retrospectively. All patients were deemed ineligible for surgical resection by a multidisciplinary tumor board.

Inclusion Criteria:

- Age ≥18 years
- Histologically confirmed malignant tumor involving the trachea or main bronchi
- Endoscopically or radiologically confirmed CAO
- Ineligibility for curative surgical resection
- Provided informed consent for intervention or retrospective inclusion

Exclusion Criteria:

- Hemodynamic instability
- Use of anticoagulants within five days prior to procedure
- Refusal to participate or inability to complete QoL assessments

Interventions: Laser resection was performed under general anesthesia using rigid bronchoscopy and a diode surgical laser system. The tumor was devascularized with low-power laser energy, followed by mechanical debulking using rigid forceps and suction [10].

Airway stenting was conducted when required, using either self-expanding metallic or silicone stents selected based on lesion location and airway anatomy. Stents were deployed under combined bronchoscopic and fluoroscopic guidance [11].

Patients in the control group received conservative palliative care, including systemic chemotherapy, supplemental oxygen, corticosteroids, and opioid analgesia. Supportive treatment protocols followed institutional palliative care guidelines.

Outcome Measures:

Primary Outcome:

- Overall survival, defined as time from intervention (or admission for controls) to death or last known follow-up.

Secondary Outcome:

- Health-related quality of life (QoL) assessed using the EuroQol 5-Dimension 5-Level (EQ-5D-5L) questionnaire. This validated tool comprises five domains: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Scores range from 1 (no problems) to 5 (extreme problems), with domain scores converted to an index value using a standardized algorithm [12].

QoL was assessed at baseline (pre-intervention) and one-month post-intervention for the intervention group. For the control group, baseline and follow-up assessments were conducted where survival permitted.

Statistical Analysis:

Survival data were analyzed using the Kaplan–Meier method, and between-group comparisons were performed using the log-rank test [13]. To quantify relative risk, Cox proportional hazards regression was used to calculate hazard ratios (HRs) with corresponding 95% confidence intervals (CIs) [14]. Cox proportional hazards models were evaluated for two predefined follow-up intervals: an early interval (5–25 weeks) to capture the initial divergence in survival, and a longer interval (10–60 weeks) to assess sustained effects over time. Hazard ratios were calculated as Intervention/Control, such that values <1 indicate reduced mortality risk associated with the intervention.

Quality of life scores were compared using paired t-tests for within-group changes and independent t-tests for between-group comparisons. All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 22.0 [15]. A p-value of <0.05 was considered statistically significant.

Results.

Baseline Characteristics:

The intervention group (n=13) had a mean age of 52.9 ± 13.5 years, with 84.6% male participants. The control group (n=12) was slightly younger, with a mean age of 43.6 ± 11.8 years and 91.7% male. Tumor involvement was most commonly localized to the left main bronchus (53.8%), followed by the right main bronchus (38.5%) and the trachea (7.7%). All patients were confirmed to have inoperable disease based on multidisciplinary tumor board evaluation. Baseline characteristics were balanced between groups with no statistically significant differences in age, sex, or tumor location. Although ECOG performance status was not systematically documented, all patients were assessed by the same multidisciplinary tumor board using uniform criteria for surgical ineligibility, ensuring comparable clinical decision-making thresholds across both groups.

Survival Outcomes:

The median survival was significantly longer in the intervention group (9.7 weeks) compared to the control group (0.6 weeks) ($p < 0.0001$). The Kaplan–Meier survival curve showed a marked early divergence between groups, sustained through 30 weeks of follow-up.

At 25 weeks, the hazard ratio (HR) for mortality in the intervention group was 0.019 (95% CI: 0.004–0.091), indicating an 98.1% relative reduction in the risk of death compared to controls ($p < 0.0001$) [16]. This 25-week hazard ratio reflects the early-period Cox model (5–25 weeks). Similar statistically significant HRs were observed at other checkpoints (10, 20, 30, 40 and 60 weeks), demonstrating a consistent survival advantage. The temporal pattern of hazard ratios across the 10–60-week interval is presented in Figure 2, illustrating the sustained relative risk reduction over longer follow-up.

Quality of Life (QoL):

At baseline, EQ-5D-5L scores were similar between groups. In the intervention group, the mean total score improved from 29.2 ± 14.4 to 43.5 ± 9.2 one-month post-intervention ($p = 0.0062$). The control group showed no significant improvement during the same period due to high early mortality.

The most notable gains were seen in:

- Pain/discomfort: improved from 4.2 ± 3.4 to 7.7 ± 2.6 ($p = 0.0079$).
- Anxiety/depression: improved from 5.8 ± 1.9 to 9.6 ± 1.4 ($p < 0.0001$).
- Trends toward improvement were also observed in:
- Mobility ($p = 0.067$).
- Self-care ($p = 0.071$).

These findings underscore the psychosocial and symptom relief benefits of interventional therapy in CAO patients [17].

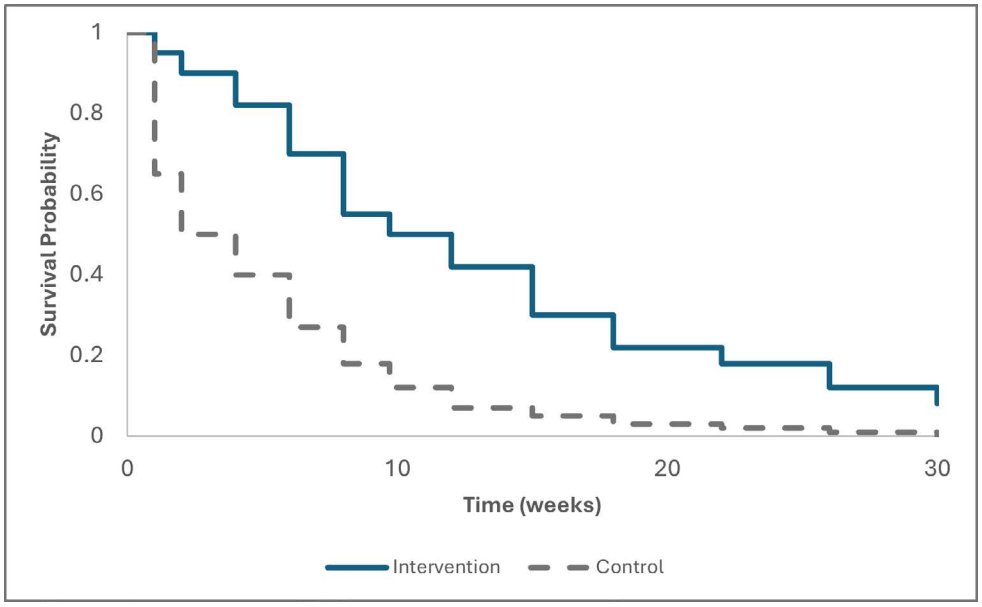

Figure 1. *Kaplan–Meier survival curves for intervention and control groups.*

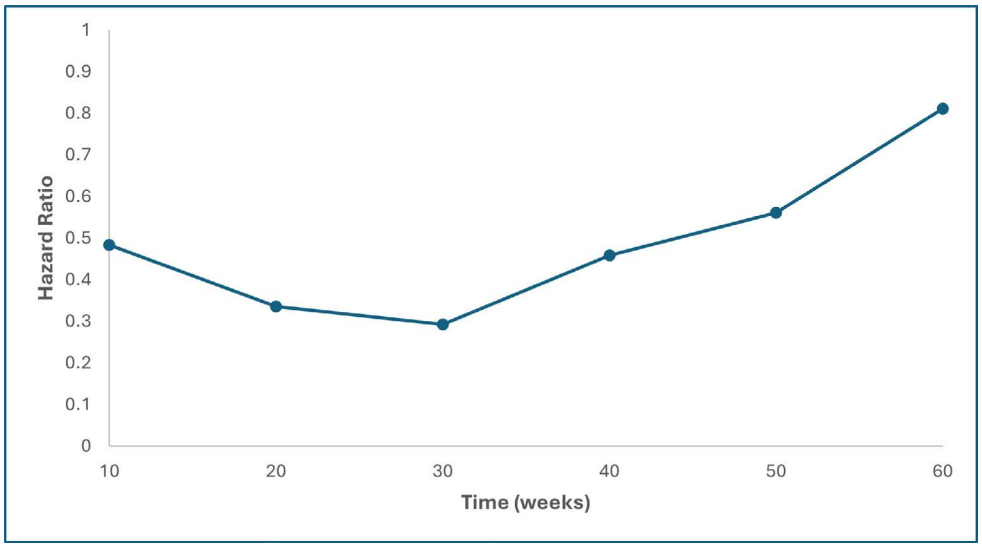

Figure 2. *Cox proportional hazards ratios over the 10–60-week interval (Intervention/Control). Hazard ratios <1 indicate reduced mortality risk in the intervention group.*

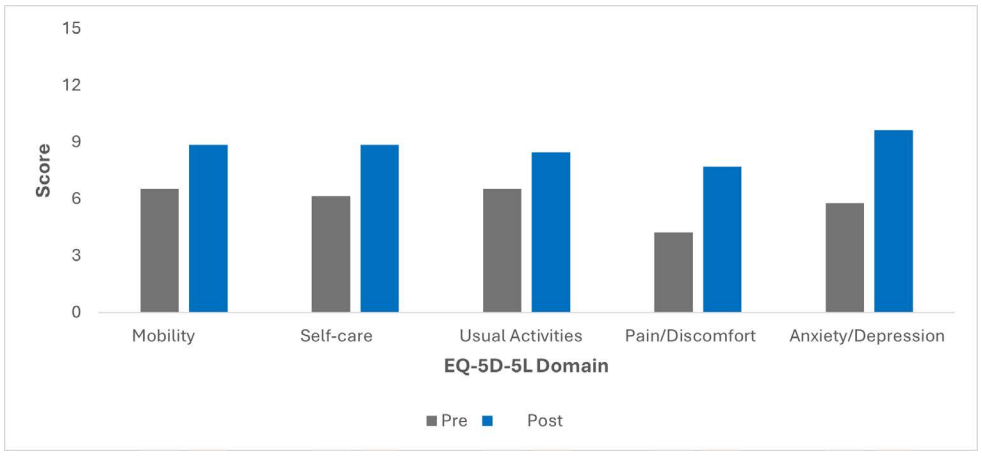

Figure 3. *EQ-5D Domain Bar Chart (Pre- vs Post-Intervention).*

Table 1. *EQ-5D-5L QoL Domain Scores Pre- and Post-Intervention.*

Dimension	Pre-Intervention	Post-Intervention	p-value
Mobility	6.5 ± 3.8	8.9 ± 2.2	0.068
Self-care	6.2 ± 4.2	8.9 ± 3.0	0.069
Usual activities	6.5 ± 3.8	8.5 ± 2.6	0.143
Pain/discomfort	4.2 ± 3.4	7.7 ± 2.6	0.0079
Anxiety/depression	5.8 ± 1.9	9.6 ± 1.4	<0.0001
Total score	29.2 ± 14.4	43.5 ± 9.2	0.0062

Discussion.

This study demonstrates that bronchoscopic laser resection and airway stenting offer significant survival and quality of life (QoL) benefits in patients with malignant central airway obstruction (CAO), particularly those deemed ineligible for curative surgical or oncologic therapies. Patients who underwent bronchoscopic intervention experienced a median survival increase of over nine weeks and substantial improvement in EQ-5D-5L QoL scores, especially in the domains of pain and emotional distress.

The observed survival benefit aligns with prior studies reporting median survival extensions of 6 to 12 weeks following airway stenting or debulking procedures [18,19]. Although these gains may appear modest, they represent clinically meaningful improvements in terminal patients, particularly when accompanied by enhanced symptom control and psychosocial well-being.

Our findings regarding pain/discomfort and anxiety/depression improvements mirror results from earlier trials that utilized the EQ-5D and EORTC QLQ-C30 instruments, suggesting that airway interventions not only relieve physical obstruction but also offer psychological reprieve [20,21]. The significant reduction in post-obstructive symptoms such as dyspnea and hemoptysis likely contributes to reduced patient distress and improved autonomy in daily activities. However, because the control group experienced very high early mortality, QoL assessment at one month primarily reflects survivors in the intervention group, introducing a degree of survivor bias into the comparison.

Statistical rigor was enhanced by using both Kaplan–Meier estimates and Cox proportional hazards modelling, which consistently showed a strong relative survival benefit favouring the intervention group. The hazard ratio of 0.019 at 25 weeks represents a >98% relative risk reduction, supporting the life-extending role of interventional bronchoscopy in advanced CAO [22].

Importantly, this study also adds value from a global health perspective. While many previously published studies on bronchoscopic CAO management originate from high-income countries, this analysis demonstrates feasibility and efficacy in a middle-income setting, where procedural resources and palliative care infrastructure are often limited [23]. By documenting the clinical outcomes in this context, we support the integration of interventional pulmonology into palliative care frameworks in low- and middle-income countries (LMICs).

Limitations.

This study has several limitations:

- Small sample size may limit generalizability and statistical power. Given the limited cohort size and the rarity of malignant CAO requiring urgent intervention, the results should be interpreted as preliminary and hypothesis-generating rather than definitive.
- The non-randomized design introduces potential selection bias, particularly in retrospective control group assembly.
- Short follow-up duration (maximum 60 weeks) may underestimate long-term complications or benefits.
- EQ-5D-5L was only administered to patients surviving one month, potentially excluding sicker individuals from QoL analysis.
- ECOG performance status was not systematically documented, which limits the ability to fully compare baseline functional capacity between groups. However, all patients were assessed by the same multidisciplinary tumor board using uniform criteria for determining surgical ineligibility, which provides a consistent framework for evaluating clinical severity, although residual baseline imbalance cannot be completely excluded.

Despite these limitations, the results are statistically robust and clinically compelling, supporting further investigation via randomized controlled trials.

Conclusion.

Bronchoscopic laser resection and endobronchial stenting are effective, minimally invasive interventions that significantly improve both survival and quality of life (QoL) in patients with malignant CAO. In this study, patients undergoing bronchoscopic intervention experienced markedly longer survival and improved symptom relief compared to those managed conservatively. Gains in pain reduction and emotional well-being, as assessed by EQ-5D-5L, underscore the palliative value of these procedures beyond merely prolonging life.

Given the favorable risk–benefit profile, these interventions should be considered an integral component of comprehensive palliative care, particularly for patients who are ineligible for curative therapies. Moreover, this study supports the feasibility of implementing advanced bronchoscopic care in resource-limited settings, reinforcing its global applicability.

Larger prospective studies and randomized controlled trials are warranted to further define optimal patient selection criteria, timing of intervention, and long-term outcomes. Given the small cohort size in the present study, these conclusions should be interpreted with caution and considered preliminary until confirmed in larger, multi-center analyses.

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