

# GEORGIAN MEDICAL NEWS

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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 ВИНТИ 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 ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

### WEBSITE

[www.geomednews.com](http://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](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. Корректур авторам не высылаются, 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 computer-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.nlm.nih.gov/bsd/uniform_requirements.html)  
[http://www.icmje.org/urm\\_full.pdf](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 საქმრალდებოლ!

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. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების 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 ფხიხლებში 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.

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## DOUBLE LUMEN TECHNIQUE (DLT) - ENDOTRACHEAL TUBE GUIDED LEVIN TUBE INSERTION TECHNIQUE

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### Abstract.

This described the Double Lumen Technique (DLT) - an endotracheal tube-guided Levin tube insertion technique, which was originally introduced in 1987. It is designed for patients who have repeatedly failed due to kinking of the Levin tube in their oropharyngeal cavity, caused by incooperation of swallowing a Levin tube, particularly in those with stupor or comatose mentality. The main concept of the DLT is to reinforce the flexibility of a Levin tube by inserting it into a more elastic tube, the endotracheal tube (E-tube). The combination of the Levin tube and the E-tube allow it to pass through the oropharyngeal cavity into the esophagus successfully. For stuporous or comatose patients who have repeatedly failed Levin tube insertion, if passage through an oropharyngeal cavity to the esophagus is difficult, the novel technique, DLT, may be a worthwhile option to try at the bedside.

**Key words.** Levin tube, endotracheal tube, Double Lumen Technique (DLT).

### Double Lumen technique (DLT).

A 78-year-old man with a history of left hemiplegia after right pontomedullary infarction and an episode of sigmoid volvulus presented to the emergency department (ED) with 7-day constipation, abdominal pain, and distension. Physical examination revealed severe abdominal distension and tenderness. X-rays showed a large bowel obstruction, likely due to a sigmoid volvulus (Figure 1A). Shortly after he arrived in the ED, a cardiac arrest due to metabolic acidosis progression (pH 7.033) occurred, and he was successfully resuscitated in 10 minutes by advanced cardiovascular life support. A Levin tube was planned to avoid further gaseous distention. However, attempts to insert the Levin tube through both nostrils in turns were unsuccessful as the patient was stuporous, and accordingly unable to cooperate during the insertion process. The physician noted difficulties in passing through the oropharyngeal cavity, as evidenced by the kinking of the Levin tube seen on a radiograph (Figure 1B). After the usual method of the Levin

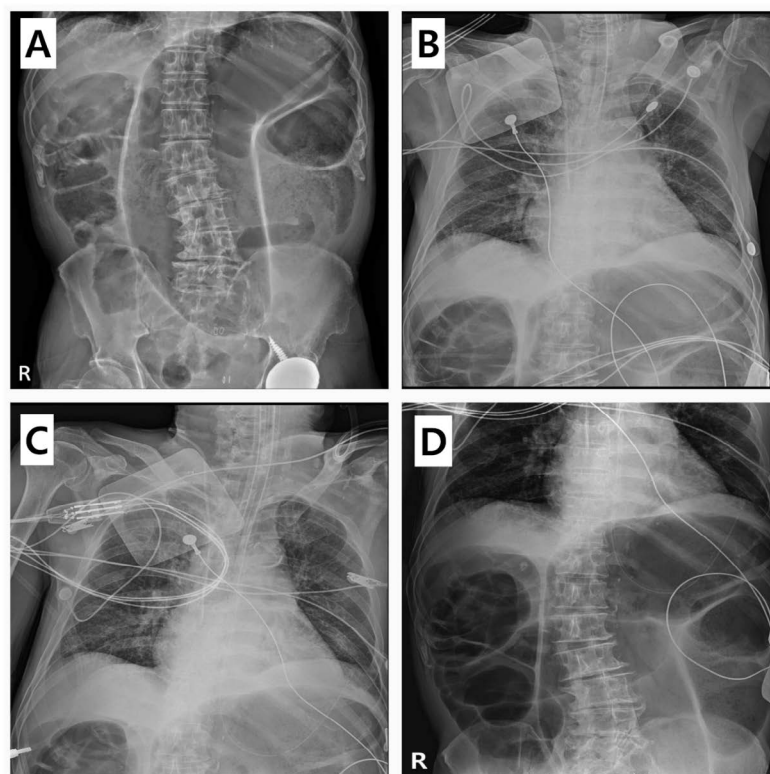
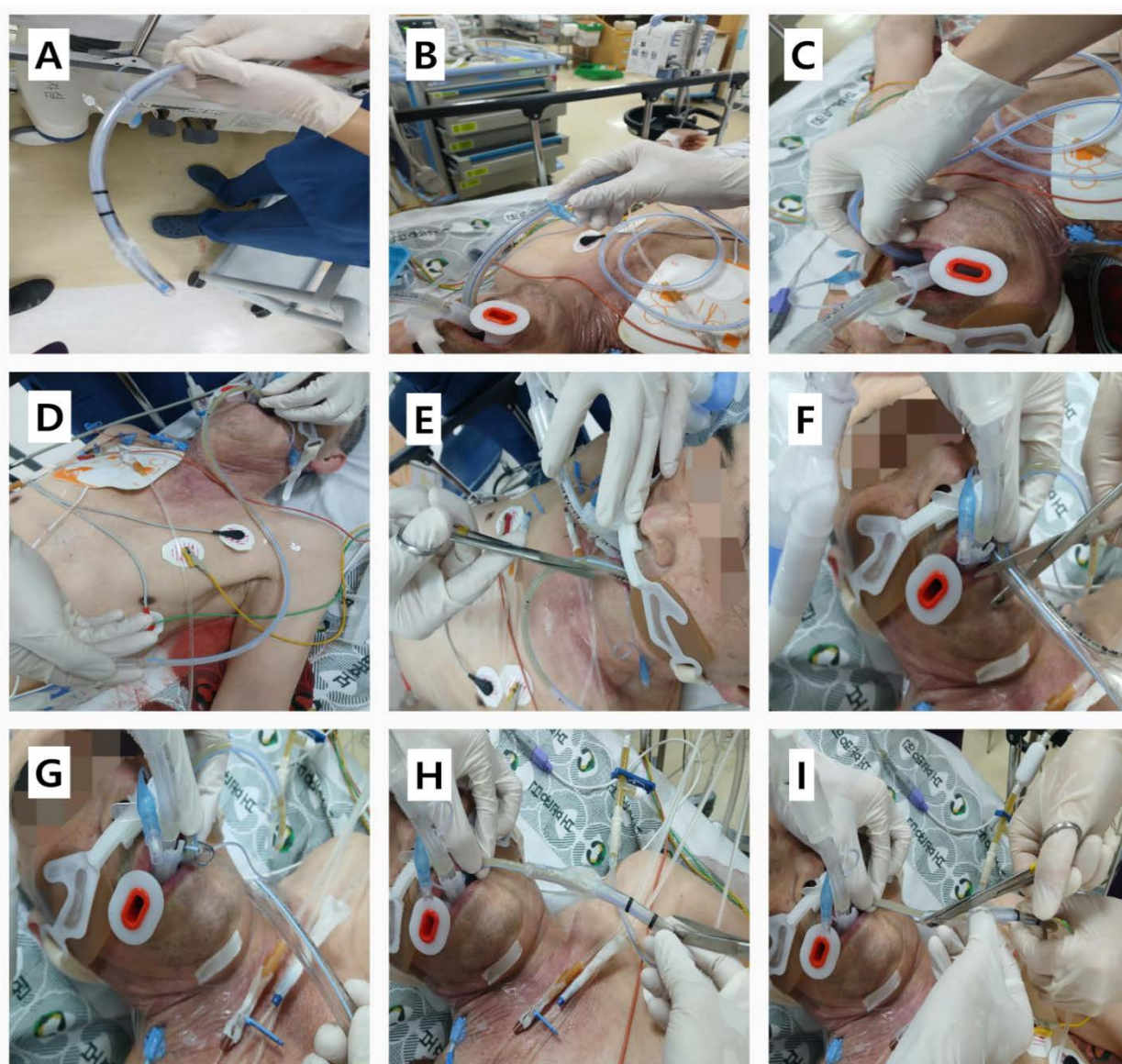


Figure 1. Serial X-ray.

Panel A shows the initial abdomen X-ray of the patient. A large bowel obstruction was shown, which was suspicious of a sigmoid volvulus. Panel B shows that the Levin tube was kinking at the oropharyngeal cavity. Panels C and D show that the Levin tube was successfully placed in the stomach via the Double Lumen Technique (DLT).



**Figure 2.** Procedure step of Double Lumen Technique (DLT).

Panel A shows the preparation of the Levin tube and the Endotracheal tube (E-tube). The Levin tube was inserted into the E-tube. Panel B shows the insertion of the combined tubes into the mouth. Panel C shows that the Levin tube was pushed in until the Levin tube was placed into the stomach while holding up the E-tube. Panel D shows the gastric contents flow through the Levin tube. Panel E shows the removal of the E-tube by scissors. Panel F shows that the distal part of the E-tube was peeled off. Panel G shows that the peeled E-tube was cut down. Panel H shows that the E-tube was almost peeled off. Panel I shows the last cutting down of the E-tube.

tube insertion failed repeatedly, the Double Lumen Technique (DLT) was tried. The Levin tube was successfully placed in the stomach (Figure 1C, D). The patient underwent sigmoidoscopic decompression, which showed sigmoid volvulus with ischemic change. Given the patient's prior health status and the Physician Orders for Life-Sustaining Treatment (POLST), his family declined surgical intervention, and he ultimately expired.

A Levin tube, also known as a nasogastric (NG) tube, is designed to deliver fluids, medications, or nutrition directly into the stomach through the nose. It is also used for decompression by removing gas or gastric contents [1,2]. The Levin tube is indicated for various medical conditions, including ileus,

stomach perforation, upper gastrointestinal bleeding, or medication/nutrition administration in patients who are unable to swallow [2]. Various complications can arise, including pain, sinusitis, bleeding, vomiting, aspiration, and perforation [3,4]. In very rare cases, intracranial placement, [5] pulmonary placement [6,7] intracardiac placement, [8] or pneumothorax can occur [9].

During the insertion procedure, a patient's swallowing motion aids the passage of a Levin tube through the nasopharynx and into the esophagus. If a patient does not cooperate with this step, [10] a Levin tube tends to be kinked in the nasopharynx as it is flexible and can be easily folded or compressed. Therefore,

kinking of the Levin tube is a frequent complication during the insertion process [11,12]. Repeated attempts at insertion may fail, requiring endoscopic or fluoroscopic assistance [13-15]. If a patient is stuporous or comatose, cooperation with the patient's swallowing motion is hard to expect. Consequently, a Levin tube insertion is prone to failure.

To deal with this clinical challenge without hesitation at the bedside, DLT was attempted for the case patient, considering that fluoroscopy/endoscopy guided insertion is not readily achievable in the ED. DLT is an endotracheal tube (E-tube) guided Levin tube insertion technique. This technique was originally introduced by Dr. Siegel in 1987 to facilitate the passage of the Levin tube through the nasopharynx to the esophagus [15]. The main concept of the DLT is to reinforce the flexibility of a Levin tube by inserting it into a more elastic tube, the E-tube.

The modified technique was attempted for the case patient, while an E-tube was inserted via a nostril in the original technique. The steps of the procedure are as follows. Firstly, the Levin tube was inserted into an E-tube. The combined tubes were inserted via the mouth till an E-tube passed the oropharynx and was placed into the esophagus (Figure 2A). The elasticity of the E-tube made this process easier than the Levin tube alone. Then, the Levin tube was pushed in till the Levin tube was placed into the stomach while holding up the E-tube (Figure 2B to D). Finally, an E-tube was removed by serial cutting down with scissors (Figure 2E to I). During the whole procedure, gentle manipulation should be kept in consideration as an E-tube is placed in the esophagus. An E-tube is a thick tube and E-tube insertion would cause a gag reflex which induce a vomiting and consequent complication such as aspiration pneumonia. Same as endotracheal intubation, physicians should ensure all safety measures regarding airway secure including suction device. In the case patient, endotracheal intubation was performed first, and DLT was performed later. When a patient is not intubated, positioning is important to reduce the risk of aspiration. A semi-Fowler's position or head-of-bed elevation position is appropriate in such cases. Physicians must always ensure that the patient's airway remains protected.

Some modifications can be proposed to DLT. Generally, a Levin tube is inserted through a nostril and fixed to the nose using a band, tape, or a commercial fixation device. Inserting a Levin tube through the mouth requires fixing it to the cheek. In instances where a patient is intubated, the Levin tube can be fixed to the E-tube, such as in the present case. Both ways may not be suitable for the long-term maintenance of the Levin tube. To deal with this problem, a modified approach can be proposed. A physician inserts a Levin tube into a nostril, advances a Levin tube through the nasal cavity to the oral cavity, picks a Levin tube tip out of the mouth, combines a Levin tube with an E-tube, and inserts the combined tubes through the mouth. Thereafter, the same steps of the DLT can be followed. However, it should be noticed that this modification would result the complications by friction damage to mucosa, such as pharyngeal, uvular, and nasal hemorrhage.

Another consideration is that an E-tube is elastic, so serial cutting down with scissors may be difficult while a Levin tube

is in an E-tube. Furthermore, harm to the patient or damage to the tube may be happened unintentionally, considering that scissoring is performed near the patient and the E-tube is thick and elastic. Thus, pre-cutting of the E-tube should be mandatory. The physician cut down the E-tube before combining a Levin tube with an E-tube. The whole or partial length of an E-tube can be cut with scissors. Rolling an E-tube with medical tapes is feasible to avoid injury from sharp edges. Then, the final stage of DLT can be achieved safer and easier than the original practice. Pre-cutting an E-tube and taping an E-tube prior to combine the Levin tube should be followed as of now.

Lastly, fluoroscopy/endoscopy guided insertion would be appropriate and seems to be preferred option if those are readily accessible. We considered DLT at bedside in the ED because the critical condition of a case patient would be worsening without rapid gastric decompression. If a conventional nasogastric tube with stylet (CORFLO) was equipped in the ED, it would be the optimal choice prior to DLT.

### **Conclusion.**

For stuporous or comatose patients who have repeatedly failed Levin tube insertion, if passage through an oropharyngeal cavity to the esophagus is difficult, the novel technique, DLT, may be a worthwhile option to try at the bedside.

### **Conflicts of Interest.**

The authors declare no conflict of interest.

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### **Ethical information.**

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### **REFERENCES**

1. Tashiro J, Vietrogoski RA, Swan KG. Abraham Louis Levin: demystifying the duodenum. *J Trauma*. 2010;69:1583-7.
2. Vadivelu N, Kodumudi G, Leffert LR, et al. Evolving Therapeutic Roles of Nasogastric Tubes: Current Concepts in Clinical Practice. *Adv Ther*. 2023;40:828-843.
3. Prabhakaran S, Doraiswamy VA, Nagaraja V, et al. Nasoenteric tube complications. *Scand J Surg*. 2012;101:147-55.
4. Motta APG, Rigobello MCG, Silveira RCCP, et al. Nasogastric/nasoenteric tube-related adverse events: an integrative review. *Rev Lat Am Enfermagem*. 2021;29:e3400.
5. Rahimi-Movaghar V, Boroojeny SB, Moghtaderi A, et al. Intracranial placement of a nasogastric tube. A lesson to be re-learned? *Acta Neurochir (Wien)*. 2005;147:573-4.
6. Pereira F, Azevedo R, Tristan J. Misplacement of a nasogastric feeding tube: a case report. *Rev Esp Enferm Dig*. 2020;112:159.
7. Metheny NA, Krieger MM, Healey F, et al. A review of guidelines to distinguish between gastric and pulmonary placement of nasogastric tubes. *Heart Lung*. 2019;48:226-235.

8. Viteri G, Larrache J, Díaz ML, et al. Nasogastric tube found in the right atrium. *J Vasc Interv Radiol.* 2012;23:721-2.
9. Thomas B, Cummin D, Falcone RE. Accidental pneumothorax from a nasogastric tube. *N Engl J Med.* 1996;335:1325.
10. Gallagher EJ. Nasogastric tubes: hard to swallow. *Ann Emerg Med.* 2004;44:138-41.
11. Prabhakaran S, Doraiswamy VA, Nagaraja V, et al. Nasoenteric tube complications. *Scand J Surg.* 2012;101:147-55.
12. Appukutty J, Shroff PP. Nasogastric tube insertion using different techniques in anesthetized patients: a prospective, randomized study. *Anesth Analg.* 2009;109:832-5.
13. Shukla NK, Goel AK, Seenu V, et al. Endoscopically guided placement of nasogastric tubes in patients with esophageal carcinoma with absolute dysphagia: report of a 3-year experience. *J Surg Oncol.* 1994;56:217-20.
14. Kelly G, Lee P. Nasendoscopically-assisted placement of a nasogastric feeding tube. *J Laryngol Otol.* 1999;113:839-40.
15. Siegel IB, Kahn RC. Insertion of difficult nasogastric tubes through a nasoesophageally placed endotracheal tube. *Crit Care Med.* 1987;15:876-7.