

## Case study of a tongue cancer patient with nutritional deficit and nausea at RSUP dr. Sardjito

Siska Triwidiastuti, Aini Inayati\*

Study Program of Nursing, Faculty of Health Sciences, Universitas Aisyiyah Yogyakarta, Indonesia

\*Email: ainiinayati10@gmail.com

### Abstract

**Background:** Squamous cell carcinoma (SCC) of the tongue is an oral malignancy that significantly affects patients' quality of life, particularly in terms of eating and speaking. Side effects of chemotherapy, such as recurrent nausea and vomiting, often lead to decreased food intake and increase the risk of nutritional deficits. Enteral nutrition via a nasogastric tube (NGT) is frequently required; however, the commonly used bolus method may worsen nausea and lead to feeding intolerance. **Objective:** To determine the effectiveness of the gravity drip technique in reducing nausea and vomiting in patients with tongue cancer undergoing chemotherapy who require NGT feeding. **Method:** This study used a case study approach within a comprehensive nursing care process, including assessment, diagnosis, planning, implementation, and evaluation, conducted over three consecutive days at Indraprastha 1 of RSUP Dr. Sardjito. **Case:** Mr. I, a 63-year-old male diagnosed with postoperative SCC of the tongue and currently undergoing chemotherapy, experienced severe nausea and vomiting 4–5 times per day, along with signs of nutritional deficit (BMI 16.8 kg/m<sup>2</sup>). Enteral nutrition was administered using the gravity drip method. **Results:** After three days of intervention, vomiting frequency decreased to zero from the second day, and nausea intensity reduced from severe to mild. The patients reported increased comfort and improved tolerance of nutritional intake. **Conclusion:** The gravity drip technique proved effective in reducing nausea and vomiting and in enhancing nutritional intake tolerance. **Recommendation:** Nurses are encouraged to consider gravity drip as a more comfortable and tolerable alternative for enteral nutrition administration in NGT-fed patients undergoing chemotherapy.

**Keywords:** gravity drip; nasogastric tube (NGT); tongue cancer

### 1. Introduction

Tongue cancer is a type of oral cancer characterized by the uncontrolled growth of abnormal cells in the tongue tissue (Indonesian Ministry of Health, 2022). Most tongue cancers are squamous cell carcinomas (SCC), accounting for over 90% of cases worldwide (Gonzales & March, 2023). According to GLOBOCAN 2020 data (IARC/WHO), approximately 45,000 to 50,000 new cases of tongue cancer are reported globally each year, with a significant mortality rate, especially in developing countries (Ferlay et al., 2021). In Indonesia, oral cancer, including tongue cancer, accounts for about 3–4% of all malignancies, and the incidence has been rising steadily over the past two decades. Most patients present at an advanced stage, which worsens the prognosis and increases mortality (Ministry of Health of the Republic of Indonesia, 2025). Beyond its impact on quality of life such as impaired speech, difficulty eating, and severe pain, tongue cancer also poses a substantial economic burden on both individuals and the healthcare system due to high treatment costs and lengthy therapy durations (Gusti et al., 2023).

Tongue cancer, as part of oral cancer, has a notable global incidence. According to GLOBOCAN 2020 data published by the International Agency for Research on Cancer (IARC), around 377,713 new cases of lip and oral cavity cancers were reported globally, with 177,757 deaths (Sung et al., 2021). In Indonesia, the same data recorded 5,329 new oral cancer cases in 2020, ranking the country sixth in Southeast Asia for this cancer type (Ferlay et al., 2021). Although specific data on tongue cancer prevalence in Indonesia is limited, the overall rise in oral cancer cases highlights the need for special attention. The Special Region of Yogyakarta (DIY) has the highest cancer prevalence in Indonesia at 4.86 per 1,000 population, based on the 2018 Basic Health Research (Ministry of Health of the Republic of Indonesia, 2022). This high rate indicates a significant cancer burden in the region, including tongue cancer, and the need for intensified early detection and prevention efforts.

Tongue cancer is more common among adults and the elderly, especially those over 45 years old (Suharto, 2020). Research shows that men have a higher risk of developing tongue cancer than women, with a ratio of up to 2:1. This is believed to be due to greater exposure to risk factors such as smoking, alcohol consumption, and betel chewing, which are more prevalent among men (Gufron, 2022).

Additionally, individuals from lower socioeconomic groups are more vulnerable due to limited healthcare access, delayed diagnosis, and lack of awareness of early signs. In Indonesia, the prevalence of oral cancer, including tongue cancer, is higher in areas with low oral health awareness and limited early screening services, such as rural areas (Mawardani & Hadi, 2025). In the Special Region of Yogyakarta (DIY), which has the highest national cancer prevalence, the elderly are the most affected group due to the high elderly population in the region (Mawardani & Hadi, 2025).

Squamous cell carcinoma (SCC) of the tongue can cause serious eating disorders due to pain, oral lesions, or post-surgical effects that impair chewing and swallowing (Indonesian Ministry of Health, 2025). This condition makes some patients unable to consume food orally, requiring nutrition through a nasogastric tube (NGT). Nutritional support is vital to prevent malnutrition, maintain immunity, and accelerate recovery. However, in tongue cancer patients undergoing chemotherapy, side effects such as nausea and vomiting can worsen feeding tolerance, especially if the method of administration is inappropriate (Suharto, 2020). Typically, NGT feeding uses the bolus technique, administering food quickly via syringe, which may worsen nausea and cause discomfort (Choi et al., 2024). A technique that can help reduce nausea is the gravity drip method, which delivers nutrients slowly and steadily with the help of gravity.

The gravity drip technique offers a slower, more stable flow of fluid compared to the bolus method, potentially reducing gastric stimulation a common cause of nausea. A study by (Nugroho et al., 2023) found that the gravity drip method reduced gastric residual volume in critically ill patients, indicating better tolerance. Another study by (Du et al., 2022) showed that slow feeding decreased the incidence of nausea and vomiting in ICU patients. Another study by (Rahim & Irwansyah, 2021) also reported increased patient comfort with gravity feeding compared to rapid syringe feeding. However, scientific evidence specifically assessing the gravity drip technique in cancer patients using NGT remains limited. Thus, this study aims to present a case study conducted in Indraprastha I RSUP Dr. Sardjito, involving a tongue cancer patient (SCC) undergoing chemotherapy and experiencing feeding problems. This case is expected to illustrate the potential of the intervention in improving nutritional tolerance and reducing nausea.

## 2. Method

This writing is a case study in the field of nursing that employs a comprehensive nursing care approach, including assessment, nursing diagnosis, planning, implementation, and evaluation. The study was conducted on a patient with tongue cancer (squamous cell carcinoma) who was undergoing chemotherapy and had a nasogastric tube (NGT) in place. The patient experienced recurrent nausea and vomiting and refused nutrition via NGT. The frequency of nausea and the volume of vomiting were regularly monitored to assess the effectiveness of the intervention. The intervention was carried out over three consecutive days, from January 28 to January 30, 2025, in the Indraprastha I RSUP Dr. Sardjito.

## 3. Results and Discussion

### 3.1. Results

The case report on Mr. I, a 63-year-old diagnosed with tongue cancer, was conducted on January 27, 2025, at Indraprastha I RSUP Dr. Sardjito. The patient underwent chemotherapy for the first time following surgical removal of the left side and the entire tongue. The main complaints were nausea and repeated vomiting during nutrition administration via a feeding tube (sonde), accompanied by frequent hiccups that disturbed his condition. The medical history revealed initial complaints since 2023 in the form of worsening tongue ulcers, followed by biopsy and diagnosis of tongue cancer, then operations in October 2023 and November 2024. The current condition is stable but has not improved, with no history of allergies or other serious illnesses.

Physical examination showed that the patient was cooperative, with a body weight of 44 kg and a height of 162 cm, resulting in a Body Mass Index (BMI) of 16.8 kg/m<sup>2</sup>, indicating malnutrition. This reflects a significant weight loss from a previous 48 kg. Oral hygiene was poor, and vital signs were stable (temperature 37.4°C, blood pressure 121/67 mmHg, pulse 78 bpm, respiratory rate 18 breaths/min, SpO<sub>2</sub> 99%). Systemic examination revealed right neck swelling, possibly due to metastasis, mouth ulcers, and limited mouth opening. Digestive and neurological functions were

normal, but speech was limited postoperatively. The patient rarely socializes due to communication limitations but has full family support and worships according to his abilities. The nursing diagnoses established were nutritional deficits related to impaired food intake due to limited mouth opening, pain, and chemotherapy side effects causing weight loss and poor nutritional status. Another diagnosis was nausea related to the toxic effects of chemotherapy, presenting with nausea and vomiting.

Interventions included nutrition administration through a feeding tube using the gravity drip technique for three consecutive days. The gravity drip technique involves slowly administering liquid nutrients by using gravitational force, with the nutrient container hung or elevated so that the nutrients flow naturally into the patient without manual pushing via syringe (bolus technique). The gravity drip technique is generally gentler and can reduce the risk of nausea and vomiting caused by rapid infusion. As part of the management, the patient also received an 8 mg injection of ondansetron every 8 hours to control nausea and vomiting symptoms caused by chemotherapy.

Before the intervention, the patient vomited 4–5 times a day and experienced frequent nausea, especially at the sight of nutrition administered via the feeding tube. The patient felt nauseous even when the nutrition was being prepared. On the first day of nutrition via the gravity drip technique, the vomiting frequency decreased to once in 24 hours, although severe nausea persisted, particularly when seeing or during feeding tube insertion. On the second day, no vomiting occurred, but nausea was still present with reduced intensity. On the third day, the patient did not vomit at all, nausea decreased to mild, and he began to tolerate the feeding tube insertion without severe nausea. Based on these results, it can be concluded that nutrition administration using the gravity drip technique is effective in reducing the frequency of vomiting and nausea during the observation period and improving the patient's tolerance to the nutrition procedure.

### 3.2. Discussion

Tongue cancer, also known as Squamous Cell Carcinoma (SCC), is a type of cancer that affects the tongue tissue, especially on the sides or underside of the tongue (Indonesian Ministry of Health, 2022). This disease causes various complaints such as severe tongue pain, non-healing sores, difficulty chewing and swallowing, excessive saliva production, and bad breath (Indonesian Ministry of Health, 2025). These conditions hinder eating and result in significant weight loss. Additionally, tongue cancer can impair speech and cause swollen lymph nodes in the neck, further reducing patient comfort and limiting daily activities (Gonzales & March, 2023). Therefore, treatment for tongue cancer should include pain management, alternative nutritional support, and wound care to prevent infection and support the optimization of oral function.

In the case of Mr. I, a painful mass was found on the side of the tongue, causing difficulty in mouth opening, chewing, and swallowing. This led to a drastic decline in nutritional status, as indicated by a weight loss from 48 kg to 44 kg in less than two weeks and a Body Mass Index (BMI) of 16.8 kg/m<sup>2</sup>, categorized as malnourished. This condition was due to impaired food intake resulting from pain, limited mouth opening, and chemotherapy side effects, including nausea.

To address this problem, nutrition was provided using the gravity drip technique, a method of slowly administering liquid food. This technique involves suspending a 20cc syringe higher than the patient, allowing the nutrient liquid to flow naturally into the patient's body without manual force. It helps minimize stimulation of the vomiting center in the brain, thus reducing the frequency of vomiting and the severity of nausea (Gusti et al., 2023). Research by (Nugroho et al., 2023) shows that the gravity drip technique is more tolerable for patients than the rapid push (bolus) method, as the slower flow reduces gastric irritation. Similarly (Rennita & Syarif Hamidi, 2020) reported that the gravity drip method effectively reduced nausea and vomiting and helped maintain better weight stability.

The gravity drip technique applied to Mr. I successfully reduced the frequency of vomiting from 4–5 times daily to none by the third day. The intensity of nausea was significantly decreased, and the patient began to tolerate the feeding process more comfortably. Although these results are promising, limitations include the short observation period and single-patient sample. Psychological factors and individual chemotherapy responses may also influence outcomes. Therefore, further studies with larger sample sizes and longer observation periods are needed to validate the effectiveness of this technique.

The success of the gravity drip technique in Mr. I was also supported by the administration of intravenous ondansetron (8 mg every 8 hours) as an antiemetic, which works by blocking serotonin

receptors in the vomiting center to reduce nausea and prevent vomiting. The combination of the gravity drip technique and medication allowed the patient to receive nutrition more comfortably and reduced the risk of complications from excessive vomiting. The effectiveness of the gravity drip method for nasogastric tube feeding may vary depending on individual patient conditions, including the severity of nausea and tolerance to enteral nutrition. A comprehensive and individualized approach is essential for optimal outcomes.

When interpreting these results, limitations such as the single-patient sample and short intervention duration must be considered. The use of ondansetron also contributed to the reduction of nausea and vomiting, making it difficult to isolate the sole effect of the gravity drip method. Subjective symptom monitoring, such as nausea intensity, may also lack accuracy. Therefore, further studies with more rigorous designs and larger samples are highly recommended to confirm the safety and effectiveness of this nutritional method for tongue cancer patients.

Overall, the results of applying the gravity drip technique in the case of Mr. I provide a valuable contribution to nursing practice in managing tongue cancer patients with swallowing difficulties. This method has proven effective in improving patient comfort by reducing nausea and vomiting, while also meeting nutritional needs. Healthcare practitioners may consider gravity drip as a gentle alternative to the manual bolus technique. Further studies with larger samples and extended observation periods are necessary to strengthen the evidence base and guide the safe and comfortable administration of nutrition for patients with tongue cancer and similar conditions.

#### 4. Conclusion

The application of the gravity drip technique in providing nutrition to patients with tongue cancer has been shown to be effective in reducing both the frequency of vomiting and the level of nausea during the enteral feeding process. This method delivers nutrients at a slow and steady rate, offering greater comfort and minimizing excessive stimulation of the vomiting center, thereby supporting the gradual fulfillment of the patient's nutritional needs. The combination with antiemetic medications such as ondansetron further enhances both the comfort and effectiveness of the therapy. Although the results were positive, the limited sample size and short duration of observation highlight the need for further research using a more comprehensive study design.

#### 5. Acknowledgements

With respect and gratitude, the author would like to express sincere appreciation to all the nurses and Clinical Instructors (CI) in the Indraprastha I Room of RSUP Dr. Sardjito for their permission, guidance, direction, and meaningful support during the process of this case study. Their guidance not only enriched the author's knowledge and skills in clinical practice, but also fostered professionalism in facing real-life situations. The excellent cooperation of the entire treatment room team greatly contributed to the smooth implementation of assessment, intervention, and evaluation with the patient. The author also expresses heartfelt gratitude to the supervisor from 'Aisyiyah University Yogyakarta for the continuous guidance, motivation, and assistance that strengthened the author throughout the completion of this Final Scientific Work of Ners (Karya Ilmiah Akhir Ners/KIAN). The role of the lecturers is essential in shaping critical thinking, developing appropriate nursing strategies, and presenting the study results in a systematic and scientific manner. Special thanks are also extended to the respondents and their families for their willingness, trust, and cooperation during the data collection process, their participation was invaluable to the success of this case study.

#### References

- Choi, B.C., Lee, S.J., Choi, E., Lee, S., & Lee, J. (2024). The Effect of Oral Diet Training in Indwelling Nasogastric Tube Patients with Prolonged Dysphagia. *Nutrients*, 16 (15). <https://doi.org/10.3390/nu16152424>
- Du, G., Liu, F., Ma, X., Chen, S., Dai, M., Wei, L., & Liu, Z. (2022). Comparison Between Percutaneous Endoscopic Gastrostomy and Nasogastric Feeding in 160 Patients with Swallowing Disturbances: A Two-Year Follow-Up Study. *Clinical Interventions in Aging*, 17 (December), 1803–1810. <https://doi.org/10.2147/CIA.S389891>

- Ferlay, J., Colombet, M., Soerjomataram, I., Parkin, D.M., Piñeros, M., Znaor, A., & Bray, F. (2021). Cancer statistics for the year 2020: An overview. *International Journal of Cancer*, 149 (4), 778–789. <https://doi.org/10.1002/ijc.33588>
- Gonzales, M., & March, A. R. (2023). Tongue Cancer. National Library of Medicine. <https://www.ncbi.nlm.nih.gov/books/NBK562324/>
- Gufron, A. (2022). NURSING CARE FOR MRS. R WITH A MEDICAL DIAGNOSIS OF TONGUE CARCINOMA METASTASES TO THE NECK IN THE BI ROOM OF RSPAL dr. RAMELAN SURABAYA By. *Braz Dent J.*, 33 (1), 1–12.
- Gusti, KM, Nugroho, D., Saputro, H., Drip, G., & Lambung, R. (2023). PROVISION OF ENTERAL NUTRITION WITH GRAVITY DRIP METHOD IN COMBINATION WITH HEAD UP 30 o IN REDUCING GASTRIC RESIDUAL VOLUME: CASE REPORT Patient care in the ICU seeks to maintain impaired body functions using high technology, *Nursing*, 281–286.
- Ministry of Health of the Republic of Indonesia. (2022). Tongue Cancer. [https://keslan.kemkes.go.id/view\\_artikel/1391/kanker-lidah](https://keslan.kemkes.go.id/view_artikel/1391/kanker-lidah)
- Ministry of Health of the Republic of Indonesia. (2025). Condition of Tongue Cancer in Indonesia. [https://keslan.kemkes.go.id/view\\_artikel/3991/syarat-kanker-lidah-di-indonesia](https://keslan.kemkes.go.id/view_artikel/3991/syarat-kanker-lidah-di-indonesia)
- Mawardani, TL, & Hadi, EN (2025). Socioeconomic factors on the gap in access to dental health services (affordability, availability and health insurance): A literature review. 18 (12), 1546–1554.
- Nugroho, EGZ, Hidayati, N., Prihatiningtyas, D., Sulistiani, RP, Afdhal, A., Rimadeni, Y., & Jamni, T. (2023). Reducing Gastric Residual Volume in Critically Ill Patients with Enteral Nutrition Using Gravity Drip and Intermittent Feeding Methods. *ASJN (Aisyiyah Surakarta Journal of Nursing)*, 4 (1), 35–39. <https://doi.org/10.30787/asjn.v4i1.1174>
- Rahim, HA, & Irwansyah, I. (2021). Differentiation of the Roles of Male and Female Nurses at the Haji Regional Hospital in Makassar City. *Sociology*, 1, 1–9.
- Rennita, H., & Syarif Hamidi, N. (2020). Effectiveness of Enteral Nutrition Provision Between Intermittent Feeding and Gravity Drip Methods on Gastric Residual Volume in Critically Ill Patients in the ICU of Aulia Hospital Pekanbaru. *Tambusai Health Journal*, 1 (4), 24–33. <https://doi.org/10.31004/jkt.v1i4.1512>
- Suharto, D. (2020). Analysis of Tongue Cancer Cases in the Context of Nursing Care Using the Comfort Theory Model Approach. *Poltekita: Journal of Health Sciences*, 12 (2), 88–94. <https://doi.org/10.33860/jik.v12i2.21>
- Sung, H., Ferlay, J., Siegel, R.L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal for Clinicians*, 71 (3), 209–249. <https://doi.org/10.3322/caac.21660>