College of Human Medicine
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Exploring Risk Factors and Rehabilitative Care for Aspiration Pneumonia After Oropharyngeal Carcinoma Treatment: A Case Report and Literature Review

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Background

- Oropharyngeal squamous cell carcinoma occurs in the posterior 1/3rd of the tongue (3)
- Common risk factors can be Human Papillomavirus (HPV), smoking, etc. (3)
- Increase in survival rates, but there are impacts on swallowing, etc.(2)
- Treatment may include surgical resection, chemotherapy, and radiation therapy (3)
  - Treatment plan may vary depending on the pathology (3)
- Patients post-treatment may develop complications such as aspiration pneumonia, dysphagia, etc. (4)
- Increasing literature exploring the impact of rehabilitative care for management of these complications (2,5)

Case Report

90-year old female presenting to emergency room due to productive cough and shortness of breath

- **Chief Complaint:** productive cough with brown sputum
- **Past medical history:** hypertension, hyperlipidemia, osteoporosis, oropharyngeal carcinoma, breast cancer, uterine cancer, gastroesophageal reflux disease (GERD)
- **Diagnostics:** elevated BNP, elevated CRP, positive sputum culture
- **Imaging:** X-ray showing lower lobe opacities bilaterally, considered to be developing pneumonia (Figure 1)
  - Video fluoroscopic swallow study completed to evaluate swallow strength (Figure 2)
- **Interventions:** Intravenous fluids, medications (aztreonam, Cardizem, azithromycin), working with speech pathologist for swallowing

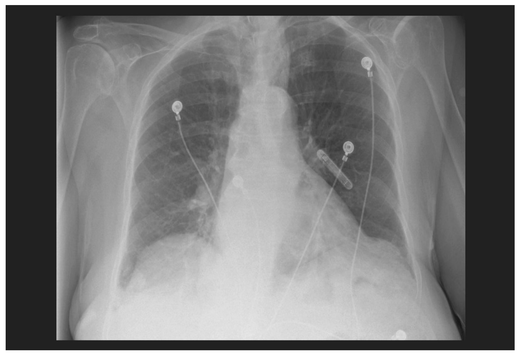


Figure 1: Patient chest X-ray on admission revealed bilateral lower lobe airspace opacities that represent developing pneumonia.

Literature Review

Study 1 by Xu, et. al.:

- Database used was Surveillance, Epidemiology, and End Results (SEER)-Medicare (4)
- Analyzed data on head and neck cancer patients and risk factors for developing aspiration pneumonia (4)
- Results:
  - Patients diagnosed at age 80 and above had a higher 5-year incidence rate of developing aspiration pneumonia versus people who were diagnosed at different age ranges (66 to 74 and 75 to 79 years of age) (4)
  - Found that surgery before radiation is associated with a lower 5-year incidence rate of developing aspiration pneumonia (4)

Study 2 by Loewen, et. al.:

- Literature review of 29 manuscripts (2)
- Examine rehabilitative programs, their timing, and the exercises included on head and neck cancer patients (2)
- Results:
  - Increased exercise of 10 repetitions three times a day was the most recommended (2)
  - Higher adherence to the exercises correlated with better outcomes (2)

Study 3 by Zhang, et. al.:

- Clinical trial testing outcomes on functional swallowing and aspiration events of patients who received targeted rehabilitative care in comparison to standard swallowing exercises in clinical practice (5)
- Patients randomized at a 1:1 ratio, and results were scaled on a range from 1-7 using the Functional Oral Intake Scale (FOIS), 1 being nothing can be swallowed by mouth and 7 being functional status with a normal diet and no restrictions (5)
- Results:
  - Aspiration rates were lower with patients who received personalized rehabilitative care (5)
  - Patients of the treatment group had significantly higher ratings at 6-7 versus the control group (5)

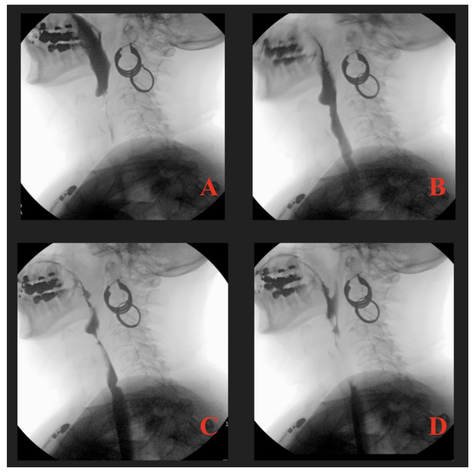


Figure 2: Four stop-frame images from a video-fluoroscopic swallow study conducted two days after admission, illustrating the progression of swallowing with residual liquid in the posterior oropharynx and epiglottic vallecula (anatomical depressions). Multiple swallow motions occurred with fluid remaining in between each time.

Conclusion

Complications and impacts on swallowing may arise following treatment and radiation to the neck. Current literature supports standard treatment, which may vary depending on the patient, with increased discussion of rehabilitative care to decrease the risk of complications and improve health outcomes.

Further areas to explore:

- Evaluating the impacts before surgery, combined with other forms of treatment, or post-surgical rehab care
- The different types of rehab care and the amount of time spent exercising the muscles involved with swallowing

References

1. Okubo, M., Iwai, T., Nakashima, H., Koizumi, T., Oguri, S., Hirota, M., Mitsudo, K., & Tohnai, I. (2017). Squamous Cell Carcinoma of the Tongue Dorsum: Incidence and Treatment Considerations. Indian journal of otolaryngology and head and neck surgery : official publication of the Association of Otolaryngologists of India, 69(1), 6–10. https://doi.org/10.1007/s12070-016-0979-z
2. Loewen, I., Jeffery, C. C., Rieger, J., & Constantinescu, G. (2021). Prehabilitation in head and neck cancer patients: a literature review. Journal of otolaryngology - head & neck surgery = Le Journal d'oto-rhino-laryngologie et de chirurgie cervico-faciale, 50(1), 2. https://doi.org/10.1186/s40463-020-00486-7
3. Winters R, Anjum F. (2026). Oropharyngeal Squamous Cell Carcinoma. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK563268/
4. Xu, B., Boero, I. J., Hwang, L., Le, Q. T., Moiseenko, V., Sanghvi, P. R., Cohen, E. E., Mell, L. K., & Murphy, J. D. (2015). Aspiration pneumonia after concurrent chemoradiotherapy for head and neck cancer. Cancer, 121(8), 1303–1311. https://doi.org/10.1002/cncr.29207
5. Zhang Y, Chen H, Zhou J and Li N (2026) Personalized swallowing rehabilitation program for post-surgical dysphagia in oral cancer patients: a randomized controlled trial. Front. Oncol. 16:1809479. doi: 10.3389/fonc.2026.1809479

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