

Anaesthetic Challenges in Malnourished Patients Undergoing Oral Cancer Surgery: A Prospective Observational StudySana Qureshi¹, Mohammed Saif Niyazi²¹Consultant Anaesthesiologist, Department of Anaesthesia, Jawahar Lal Nehru Cancer and Research Hospital, Bhopal, M.P., India²Consultant Orthopaedic Surgeon, Department of Orthopaedics, Shri Rawatpura Sarkar Institute of Medical Sciences and Research, Pacheda, Chattisgarh, India

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Abstract

Background and Aims: Malnutrition is frequently encountered in patients with oral cancer due to decreased oral intake, tumour-related obstruction, and systemic metabolic alterations. Poor nutritional status may influence perioperative anaesthetic management and postoperative outcomes. The present study aimed to evaluate the impact of malnutrition on anaesthetic challenges and perioperative complications in patients undergoing oral cancer surgery.

Methods: This prospective observational study included 80 patients scheduled for elective oral cancer surgery under general anaesthesia. Nutritional status was evaluated using body mass index (BMI), serum albumin levels, and history of weight loss. Patients were categorized into malnourished and non-malnourished groups. Airway assessment, intraoperative haemodynamic changes, anaesthetic drug requirement, and postoperative complications were analysed.

Results: Among the 80 patients, 48 (60%) were identified as malnourished. Difficult airway predictors including higher Mallampati grade, reduced thyromental distance, and restricted neck mobility were significantly more common in the malnourished group ($p < 0.05$). Intraoperative hypotension occurred more frequently in malnourished patients compared with well-nourished patients (37.5% vs 15.6%). Postoperative complications such as delayed recovery and requirement of intensive care were also higher among malnourished individuals.

Conclusion: Malnutrition is common among oral cancer patients and is associated with increased perioperative anaesthetic challenges. Early identification and nutritional optimisation may improve perioperative outcomes.

Keywords: Oral Cancer, Malnutrition, Anaesthesia, Difficult Airway, Perioperative Complications.

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Introduction

Oral cancer represents a significant health burden worldwide, particularly in developing countries where tobacco and alcohol consumption remain prevalent risk factors.[1] Patients with oral malignancies frequently experience reduced oral intake, dysphagia, and tumour-related pain, which predispose them to poor nutritional status.[2] Malnutrition has been recognised as an important determinant of perioperative morbidity. It can lead to impaired immune response, delayed wound healing, and increased susceptibility to infections.[3] In addition, nutritional deficiency may alter the pharmacokinetics of anaesthetic agents and contribute to haemodynamic instability during anaesthesia.[4] Airway management in oral cancer surgery often presents challenges due to tumour infiltration, restricted mouth opening, fibrosis, and anatomical distortion of the upper

airway.[5] These factors may further complicate anaesthetic management when combined with poor nutritional status. Although the relationship between malnutrition and surgical outcomes has been investigated in several malignancies, limited data are available regarding its influence on anaesthetic management in oral cancer surgery. Therefore, this study was undertaken to evaluate the prevalence of malnutrition and its association with airway difficulty, haemodynamic instability, and postoperative complications in patients undergoing oral cancer surgery.

Methods

This prospective observational study was conducted in the Department of Anaesthesiology at a tertiary care teaching hospital after obtaining approval from the Institutional Ethics Committee.

Written informed consent was obtained from all participants.

Inclusion Criteria

- Patients aged 18–70 years
- Diagnosed with oral cancer
- Scheduled for elective surgical resection under general anaesthesia

Exclusion Criteria

- Severe cardiovascular disease
- Renal insufficiency
- Emergency surgical procedures
- Patients declining consent

Nutritional Assessment

Preoperative nutritional evaluation was performed using the following parameters:

- Body mass index (BMI)
- Serum albumin level
- History of significant weight loss during the preceding six months

Patients were classified as malnourished if any of the following were present:

- BMI <18.5 kg/m²
- Serum albumin <3.5 g/dL
- Unintentional weight loss exceeding 10%

Airway Assessment

Airway evaluation included:

- Mallampati classification

- Thyromental distance
- Mouth opening
- Neck mobility

Anaesthetic Management: Standard monitoring included electrocardiography, non-invasive blood pressure, pulse oximetry, and capnography. Anaesthesia was induced using propofol, fentanyl, and vecuronium, followed by endotracheal intubation. Anaesthesia was maintained with inhalational agents and intermittent muscle relaxants.

Outcome Measures

The following variables were recorded:

1. Predictors of difficult airway
2. Intraoperative haemodynamic instability
3. Anaesthetic drug requirement
4. Postoperative complications
5. Need for intensive care unit admission

Statistical Analysis: Data were analysed using SPSS version 26. Continuous variables were expressed as mean \pm standard deviation, whereas categorical variables were presented as frequency and percentage. Statistical comparison between groups was performed using the independent t-test and chi-square test. A p value <0.05 was considered statistically significant.

Results

A total of 96 patients were screened, and 80 patients fulfilled the inclusion criteria and were analysed.

Table 1: Demographic characteristics

Parameter	Malnourished (n=48)	Non-malnourished (n=32)	p value
Age (years)	54 \pm 9	52 \pm 10	0.38
Male (%)	72.9	68.7	0.67
BMI (kg/m ²)	17.2 \pm 1.1	22.8 \pm 2.4	<0.001
Serum albumin (g/dL)	3.1 \pm 0.4	3.9 \pm 0.5	<0.001

Malnutrition was present in 48 patients (60%).

Table 2: Airway predictors

Parameter	Malnourished	Non-malnourished	p value
Mallampati grade III/IV	45.8%	25%	0.04
Reduced thyromental distance	37.5%	18.7%	0.03
Restricted neck mobility	41.6%	21.8%	0.02

Table 3: Perioperative complications

Complication	Malnourished	Non-malnourished	p value
Intraoperative hypotension	37.5%	15.6%	0.01
Delayed recovery	25%	12.5%	0.04
ICU admission	20.8%	9.3%	0.03

Discussion

The present study demonstrates that malnutrition is highly prevalent among patients undergoing oral cancer surgery. Similar observations have been

reported in previous studies evaluating nutritional status in head and neck malignancies [6].

Airway management represents a major concern in patients with oral malignancies due to tumour-

related anatomical changes and reduced mouth opening [7]. In our study, difficult airway predictors such as higher Mallampati grades and reduced thyromental distance were more frequent in malnourished patients.

Malnutrition may also contribute to haemodynamic instability during anaesthesia because of reduced intravascular volume and diminished protein reserves, which may affect the distribution of anaesthetic drugs [8]. Consequently, the incidence of intraoperative hypotension was higher in the malnourished group. Furthermore, postoperative complications including delayed recovery and increased requirement for intensive care were observed more frequently among malnourished patients. Poor nutritional status has been associated with impaired wound healing, increased infection rates, and prolonged hospital stay [9].

These findings emphasise the importance of preoperative nutritional evaluation and optimisation in patients undergoing major head and neck surgery.

Limitations

The present study had certain limitations. The sample size was relatively small and the study was conducted at a single centre. Additionally, nutritional assessment was limited to BMI and serum albumin rather than comprehensive nutritional scoring tools.

Conclusion

Malnutrition is common in patients undergoing oral cancer surgery and is associated with increased anaesthetic challenges and perioperative complications. Routine nutritional screening and

optimisation may improve perioperative outcomes in this patient population.

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