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A PROSPECTIVE STUDY OF IMPLICATIONS OF STRUCTURED REPORTING ON OESOPHAGEAL CANCER, ANDHRA PRADESH, INDIA.

*Duddu Gowtham Surya, Chintakunta Gurivi Reddy, Gonapati Sheethal, Rani Tadicherla**
Assistant Professor, Department of Radiodiagnosis, Siddhartha Medical College, Vijayawada, Andhra Pradesh, India.

Abstract

Background
To enhance clinical results, oesophageal carcinoma, a major cause of death that affects millions of people globally, needs a personalised treatment plan based on the disease's particular stage. The study aimed to evaluate the influence of incorporating a structured report template on the excellence of computed tomography reports pertaining to cases of oesophageal carcinoma.

Methods
This prospective study, conducted at Siddhartha Medical College, involved 60 confirmed cases of oesophageal carcinoma from January to November 2023. Two radiologist's utilized distinct reporting methods, with one employing a structured format, adhering to the seventh edition of 'TNM Staging System for Oesophageal Cancer,' while ethical considerations and potential biases were addressed in data collection and analysis.

Results
In this study involving 60 patients, adenocarcinoma (AC) was diagnosed in 40 individuals, and squamous cell carcinoma (SCC) in 20, with a median age of 64 for both groups, predominantly affecting men. Treatment patterns revealed over 72.7 % utilization of radiation therapy for SCC, while surgery was frequently recommended for AC. The structured reporting template significantly enhanced the overall understanding of oesophageal carcinoma cases, with surgeons expressing a clear preference for the structured format, particularly in cases where it proved more effective in providing necessary details for surgical planning.

Conclusion
This study underscores the efficacy of a structured reporting template in enhancing diagnostic clarity for oesophageal carcinoma. Surgeons exhibited a preference for this format, emphasizing its potential for improved comprehension and surgical planning.

Recommendation
The study recommends the widespread adoption of structured reporting templates for oesophageal carcinoma to optimize diagnostic understanding. Further integration and training on structured reporting are advised to enhance its effectiveness in clinical practice.

Keywords: *Oesophageal Carcinoma, Structured Reporting, Diagnostic Clarity, Surgeon Preference*
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*Corresponding author: Rani Tadicherla**
Email: t.rani2002@gmail.com
Assistant Professor, Department of Radiodiagnosis, Siddhartha Medical College, Vijayawada, Andhra Pradesh, India.

Introduction
Oesophageal carcinoma, a leading cause of death affecting millions worldwide, requires a customized treatment approach tailored to the specific stage of the disease in order to improve clinical outcomes [1, 2]. In the early stages, this carcinoma exhibits a favourable 5-year survival rate ranging from 57% to 78% [3, 4]. Medical imaging, particularly multidetector computed tomography (MDCT), is important for identifying different aspects of locally advanced oesophageal cancer and metastases. This aids surgeons in determining the appropriate course of management. Although several types of oesophageal cancer remain to be prevalent, the most common one affecting people of all age groups are adenocarcinomas (AC) and squamous cell carcinomas (SCCs) [5].

Although several factors predispose patients to SCC, tobacco use or smoking remains to be the most significant risk factor [6]. This highlights the importance of understanding and addressing lifestyle factors to keep track of the major predisposing factors that contribute to

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the development of oesophageal carcinoma. Conversely, the development of adenocarcinoma is linked to conditions such as gastric reflux and consequent Barrett's esophagus, which result from long-term mucosal lining inflammation and dietary aspects [7].

In the context of carcinoma of the esophagus, imaging studies play a pivotal role in identifying local invasion and metastasis. This information is invaluable for surgeons in the triage of patients and the selection of an appropriate management strategy. In this report, we have used the TNM staging system for the evaluations which adhered to the most recent seventh edition of 'TNM Staging System for Oesophageal Cancer' (AJCC) [8]. Accordingly, a structured reporting method in a tabular layout was presented in this study, prioritizing the depiction of oesophageal wall growth and its associations with neighbouring structures in a clear and efficient manner.

The study aimed to evaluate the influence of incorporating a structured report template on the excellence of computed tomography reports pertaining to cases of oesophageal carcinoma.

Materials and Methods

Study design

A prospective investigation.

Study setting

The present investigation was conducted at Siddhartha Medical College, Government General Hospital in Vijayawada, a tertiary center located in Andhra Pradesh, India, spanning from January 2023 to Nov 2023. This hospital spans over a large area in Andhra Pradesh and its neighbouring regions, making it a crucial hub for tumor care in the region.

Inclusion and exclusion criteria

Patients with proven cases of oesophageal carcinoma were included in this study. In contrast, those undergoing neoadjuvant therapy, or having a prior history of carcinoma in any other organ were excluded in the study.

Participants

The study included 60 confirmed cases of oesophageal carcinoma.

Study size

The sample size for this study was determined by carefully considering the inclusion and exclusion criteria. Specifically, individuals with confirmed cases of oesophageal carcinoma were included in the study, ensuring that the participants had the target medical condition under investigation. On the other hand, those undergoing neoadjuvant therapy or having a previous history of carcinoma in any other organ were excluded from the study to maintain a focused and homogeneous study population. As a result, a total of 60 participants with confirmed oesophageal carcinoma were included in the study, meeting the predefined criteria, and ensuring that the sample was representative of the specific patient group under investigation. This rigorous selection process helped ensure the validity and relevance of the study's findings to the intended research objectives.

Data collection

Each individual case underwent examination by two qualified radiologists, each employing distinct reporting methods. One radiologist utilized a descriptive format, offering a detailed narrative analysis, while the other opted for a structured report, presenting findings in a systematic tabular format. The TNM staging system used for these assessments adhered to the most recent edition, specifically the seventh edition of 'TNM Staging System for Oesophageal Cancer' (AJCC). This approach ensured a comprehensive and standardized evaluation of oesophageal cancer cases within the study parameters. The creation of a structured reporting format involved designing a tabular layout, with a primary focus on depicting oesophageal wall growth, its associations with neighbouring structures, and prioritizing the ease of reporting as the central objective.

Bias

The study may be biased due to the potential influence of pre-existing expectations or preferences in designing the structured reporting format. Furthermore, the utilization of two separate radiologists employing different reporting methods introduces inter-observer variability, potentially biasing the study results. Addressing and acknowledging these potential biases is essential to ensure the objectivity and reliability of the study findings.

Ethical consideration

Throughout the study, ethical considerations took precedence, marked by the acquisition of written consent from the participant and approval sanctioned by the local human research ethics committee. Stringent adherence to ethical standards ensured the rigorous preservation of patient confidentiality and privacy.

Statistical Analysis

Percentages were used to represent categorical variables while mean was utilized to represent continuous variables. Comparison of groups used Fisher's exact test, Chi-squared, and unpaired t-test. The level of statistical significance was established at $p \leq 0.05$.

Results/Outcomes

Participants

Among the 60 patients enrolled in this study, 40 were diagnosed with non-metastatic adenocarcinoma (AC) while the remaining 20 were diagnosed with squamous cell carcinoma (SCC). Accordingly, they were classified

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into two groups, namely AC and SCC group. The median age of the patients belonging to these groups were 64 years with men being the most frequently affected ones. Patients aged above 50 years accounted for over 68.2 % (27 individuals) and 73.8 % (15 individuals) of the AC and SCC group, making age an important risk factor to be considered. The most commonly used treatment option for SCC group was radiation therapy which accounted for over 70 % of the patients while patients in the AC were often recommended surgery as shown in Table 1.

Table 1: General characteristics of the patients

Characteristics	Patients in AC group (n = 40)	Patients in SCC group (n = 20)
Men (%)	24 (60 %)	13 (65.4 %)
Women (%)	16 (40 %)	7 (34.6 %)
Age < 50 years	13 (31.8 %)	5 (26.2 %)
Age > 50 years	27 (68.2 %)	15 (73.8 %)
Radiation therapy	29 (72.7 %)	8 (39.3 %)
Surgery	11 (28.3 %)	12 (61. 7 %)

The reporting template structured for oesophageal carcinoma cases enhanced the clarity and organization of diagnostic information. This template, designed for radiological assessments, adopted a tabular format to systematically present details related to oesophageal wall growth such as site and longitudinal length of tumor growth as well as its associations with surrounding structures (Table 2).

Table 2: Structured Reporting Template for Oesophageal Carcinoma: Radiological Assessment

Tumor site	
Lengthwise dimensions of the outgrowth	
Circumferent space of the outgrowth	
Proximity of upper tumor borders to the carina.	
Proximity of lower tumor border to the gastroesophageal junction.	
Curve of attachment to the aorta	
Subdermal fat triange	
T1/2 Versus >T3T3 T4	Tumor infiltrates the serosal layer without encroaching on neighboring structures **T4a:** tumor penetrates the serosa, affecting the visceral peritoneum which includes the pleura, pericardium, diaphragm-Resectable. **T4b:** tumor penetrates the nearby structures (tracheo-bronchial tree, aorta, vertebra) -Unresectable.
Mediastinal lymph nodes	**N1:**1 to 2 proximal lymph nodes. **N2:** 3 to 6 proximal lymph nodes. **N3** **N3a:** 7 to 15 proximal lymph nodes.

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	N3b: > 15 proximal lymph nodes
Metastasis	**M1a**- Infiltration of celiac lymph nodes (lower esophageal carcinoma) or cervical lymph nodes - (upper cervical carcinoma). **M1b** – metastasis of the distant organs.

During the assessment phase, surgeons were provided with both conventional descriptive reports and the newly introduced structured reports for their insights. Notably, the structured reports demonstrated a heightened ability to enhance the overall understanding of each case scenario, offering a more comprehensive perspective compared to the conventional descriptive reports.

In the subjective feedback provided by surgeons, a distinct preference emerged for extracting information from the structured reports. Surgeons found the structured format to facilitate a smoother process of information retrieval. This preference was particularly evident in cases of oesophageal carcinoma, where the structured reports were observed to be more effective in providing surgeons with the necessary and sufficient details crucial for comprehensive surgical planning.

Discussion

The appealing format of structured reports is designed to meet physicians' preferences, potentially facilitating better comprehension. This preference, along with the format's utility for practitioners and hospital administrators seeking service improvements, highlights the potential of structured reporting to positively impact efficiency, accuracy, physician satisfaction, and overall service quality within the healthcare setting. The advantages of structured radiology reports for oesophageal carcinoma over conventional reporting, as supported by prior literature, are noteworthy [9, 10]. Structured reports exhibit a notable edge in efficiency, being generated more swiftly without the need for extensive dictation, thereby saving valuable time. Moreover, the structured format enhances the accuracy and completeness of diagnostic information, contributing to a more thorough understanding of the condition as proven by previous studies [11, 12].

The findings of this study, consistent with similar work, suggest that structured reports offer a time-efficient alternative to conventional reporting, addressing the demand for faster and more streamlined processes in the medical field [13, 14]. This is particularly significant in the context of oesophageal carcinoma, where prompt and accurate diagnosis is crucial for determining appropriate treatment strategies.

Moreover, the study reiterates findings consistent with previous research, highlighting the potential advantages of structured reports in terms of accuracy, completeness, and overall appeal [15, 16]. The structured format not only expedites the reporting process but also enhances the delivery of precise and comprehensive diagnostic information, aligning with earlier observations. Physicians' preference for this format highlights its potential to improve communication between radiologists and clinicians, ultimately enhancing patient care.

The study's implications extend beyond individual patient interactions, suggesting broader utility for practitioners and hospital administrators striving to optimize healthcare services. The structured reporting template emerges as a valuable tool that aligns with the evolving needs of the medical community, offering a promising avenue for enhancing both efficiency and quality of care in the prognosis and management of oesophageal carcinoma.

Conclusion

The present study underscores the importance of thorough reporting for the successful management of oesophageal cancer, highlighting the significance of employing structured approaches backed by evidence. Quality reporting is vital for interdisciplinary communication, and a systematic, structured format proves advantageous in this context. The adoption of structured reporting for oesophageal carcinoma enhances surgical planning, leading to higher satisfaction among referring surgeons when compared to traditional full-text descriptive reports. These results emphasize the importance of structured approaches in optimizing the prognosis and management of oesophageal carcinoma.

Limitations

Limitations include a small sample size and a confined timeframe, potentially impacting generalizability. Additionally, the study's focus on the advantages of structured reporting without exploring potential drawbacks and the reliance on subjective surgeon feedback introduce potential biases.

Recommendations

The study recommends expanding the sample size for enhanced generalizability and exploring potential drawbacks of structured reporting in oesophageal cancer cases. Ongoing training for healthcare professionals is also advised to optimize the effective utilization of structured reporting in clinical practice.

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List of Abbreviations

MDCT - Multidetector Computed Tomography

AC - Adenocarcinoma
SCC - Squamous Cell Carcinoma

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