Long-Term Outcome of Endoscopic Resection in Patients With Superficial Esophageal Squamous Cell Carcinoma Invading the Muscularis Mucosae or Superficial Submucosa

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Introduction: Prior studies have reported that endoscopic resection (ER) has curative potential for early esophageal squamous cell cancer (SESCC) invading into muscularis mucosa (MM) or superficial submucosa ≤200 μm (SM1) with good outcomes. However, management of these lesions remains controversial.

Methods: We retrospectively reviewed 129 patients with SESCC with MM invasion (n=107) or SM1 invasion (n=22) who underwent endoscopic EMR between 2000 and 2012. Patients with SESCC were classified into two subgroups based on whether they were undergoing EMR with a follow-up period of 5 years or longer (long-term follow-up) or not (short-term follow-up). The outcomes of these two groups were compared.

Results: The 5-year overall survival rates of patients with MM and SM1 with and without LVI and SM1 were 96.3%, 83.1% and 96.3%, respectively. The 5-year disease-specific survival rates of patients with MM with and without LVI and SM1 were 100%, 90.0% and 100%, respectively. None developed recurrence or mortality associated with the lesion.

Conclusions: ER has curative potential for SESCC that invades MM or SM1, but further studies are needed to determine the optimal endoscopic treatment for SESCC with SM1 invasion.

Tu1217
The Use of Convolutional Neural Artificial Intelligence Network to Aid the Diagnosis and Classification of Early Esophageal Neoplasia: A Feasibility Study

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Abstract

Introduction: In this study, we introduce a convolutional neural network (CNN) to aid in the diagnosis and classification of early esophageal neoplasia. The CNN is trained to classify early esophageal neoplasia and its subtypes based on endoscopic images.

Methods: A total of 218 endoscopic images were collected and used to train the CNN. The images were classified into four categories: normal, dysplasia, intramucosal carcinoma, and submucosal carcinoma. The CNN was trained using a convolutional neural network architecture with 12 layers. Each layer consists of multiple convolutional filters, and the output of each layer is fed into the next layer as input. The final layer consists of four fully connected neurons, each representing one of the four categories.

Results: The CNN achieved an accuracy of 93.8% on a test set of 100 images. The sensitivity and specificity for each category were 96.3% and 93.8%, respectively. The network was able to classify early esophageal neoplasia with high accuracy and specificity.

Conclusions: The use of CNN to aid in the diagnosis and classification of early esophageal neoplasia is feasible. Further studies are needed to evaluate the performance of the CNN in a clinical setting.

Long-term outcome of patients after ER

<table>
<thead>
<tr>
<th>Number</th>
<th>Relapse, median follow up(month)</th>
<th>5-year overall survival (%)</th>
<th>5-year disease free survival (%)</th>
<th>5-year cause specific survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM, LVI (+)</td>
<td>total (n=16)</td>
<td>3(19%)</td>
<td>51</td>
<td>83.1</td>
</tr>
<tr>
<td>observed</td>
<td>1 (14%)</td>
<td>72</td>
<td>96.3</td>
<td>95.2</td>
</tr>
<tr>
<td>prophylactic CRT (n=9)</td>
<td>2 (22%)</td>
<td>62</td>
<td>100</td>
<td>88.9</td>
</tr>
<tr>
<td>SM1</td>
<td>total (n=22)</td>
<td>0 (0%)</td>
<td>69</td>
<td>96.3</td>
</tr>
<tr>
<td>observed</td>
<td>0 (0%)</td>
<td>41</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>prophylactic CRT (n=14)</td>
<td>0 (0%)</td>
<td>78.5</td>
<td>100</td>
<td>93.8</td>
</tr>
</tbody>
</table>
Introduction: Although the incidence of esophageal foreign body impaction (EFBI) in the general population is rare, it is an important emergency that results in significant morbidity and mortality. There is a scarcity of data in regards to emergency department (ED) utilization for EFBI. This study examines the National Emergency Department Sample (NEDS), which includes a large number of ED visits for EFBI, to evaluate ED use, financial charges, rates of admission, and risk factors for admission in EFBI patients. Methods: The NEDS was queried to evaluate the temporal trends in adult ED visits for a primary diagnosis of EFBI (ICD-9 CM code 955.3) from 2006-2012, as well as rates of hospital admission and total charges. A survey logistic regression model was used to determine the predictive value of selected variables for admission. All statistical analyses were performed using SAS (Version 9.4, The SAS institute, Cary, NC). Results: There were a total of 478,475 ED visits for EFBI from 2006 to 2012. Number of visits for EFBI increased by 17% from 62,528 in 2006 to 73,002 in 2012 (p<0.0001). ED charges rose from $2,413 in 2006 to $4,479 in 2012 (p<0.0001). Charges for hospitalization similarly increased from $15,438 to $25,389 over this time interval. However, the proportion of EFBI patients admitted did not significantly change (p=0.26). Length of stay (LOS) averaged 2.3 days and percent admitted averaged 6.4% during the time period, and the LOS did not change over the time period (p=0.46). Independent risk factors for inpatient admission from ED were: female sex (OR 1.18 (95% CI 1.11-1.25) p<0.0001), age group >84 (2.05 (1.8-2.3) p<0.0001), smoking (1.95 (1.74-2.13) p<0.0001), alcohol use (5.22 (4.25-6.42) p<0.0001), obesity (4.95 (4.10-5.98) p<0.0001), increased Charlson comorbidity index (1.72 (1.67-1.78) p<0.0001), and residing in a zip-code where average income falls in the lowest quartile (1.24 (1.10-1.40) p<0.0001). Conclusion: ED visits and associated charges for EFBI have increased between 2006 and 2012. Even though rates of admission haven’t changed substantially, charges for an admission have substantially increased. In addition, this study was able to identify certain independent risk factors for admission for EFBI. These include female sex, advanced age, smoking, alcohol use, obesity, increased comorbidities, and living in a zip code with lower mean income. Identification of these risk factors may lead to development of educational or medical interventions to address these issues.

Tu1218
Incidence, Admission Rate and Economic Burden of Adult Emergency Visits for Esophageal Foreign Body Impaction: Data From the National Emergency Department Sample From 2006 and 2012
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Introduction: Although the incidence of esophageal foreign body impaction (EFBI) in the general population is rare, it is an important emergency that results in significant morbidity and mortality. There is a scarcity of data in regards to emergency department (ED) utilization for EFBI. This study examines the National Emergency Department Sample (NEDS), which includes a large number of ED visits for EFBI, to evaluate ED use, financial charges, rates of admission, and risk factors for...