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Diagnosing conduit leak after esophagectomy for esophageal cancer by computed tomography leak protocol and standard esophagram: Is old school still the best?

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ABSTRACT

The imaging modalities available to evaluate anastomotic leak complicating esophagectomy include CT-Esophageal Protocol (CTEP) and esophagram. The purpose of this study was to compare the performance of these two modalities, alone or in combination, with the final diagnosis of leak established by endoscopy, surgery and/or the clinical course and evaluate management implications.

1. Introduction

Esophageal conduit leak is a major complication after esophagectomy and can result in serious morbidity, prolonged intensive care, longer hospital admissions, and increased mortality [1–3]. In the past decade, patient outcome after conduit leak has improved as a result of prompt diagnosis and appropriate management [4–8] and effective therapy relies heavily on early diagnosis. Standard Esophagram (SE) has traditionally been used to evaluate conduit leaks. The use of SE in the evaluation of a conduit leak has been validated in studies with small numbers of patients [9–13]. Conduit leak after esophagectomy poses a different clinical and imaging scenario than that of esophageal perforation. In this regard, SE early after esophagectomy can be difficult to perform as patients have limited mobility and may be unable to swallow the large amounts of contrast needed for evaluation. Since 2005 a CT esophageal conduit leak protocol (CTLP) has been implemented at our institution to diagnose esophageal conduit leaks. The purpose of this study was to review the role of CTLP and SE in the diagnosis and treatment of patients with a clinical suspicion for a conduit leak after esophagectomy for esophageal cancer.

2. Materials and methods

In this retrospective study, we reviewed the charts of 382 consecutive patients who had undergone esophagectomy for esophageal cancer between September 1, 2005, and August 30, 2009 [5] from the Thoracic Surgery database. There are 6 different types of esophageal resections performed at our institution; decision for each is based on tumor location, patient co-morbidities, and surgeon preference. Based on the database from our thoracic surgery department, the incidence of leak at our institution is statistically similar at all levels of anastomosis and all techniques (data not shown). In order to focus on the characteristics and performance of the imaging studies we left the surgery descriptions out of this paper. We searched for the patients with clinical suspicion of conduit leak, which then formed the study group. We revised the imaging studies pertinent to the suspected conduit leak and conducted a longitudinal review of clinical and hospital discharge notes pertaining to the first 31 days after esophagectomy.

2.1. Definition of conduit leak

Since there is no universal consensus on how to define anastomotic leak after esophagectomy [14], the presence of conduit leak, for the purposes of this study was defined and established retrospectively in

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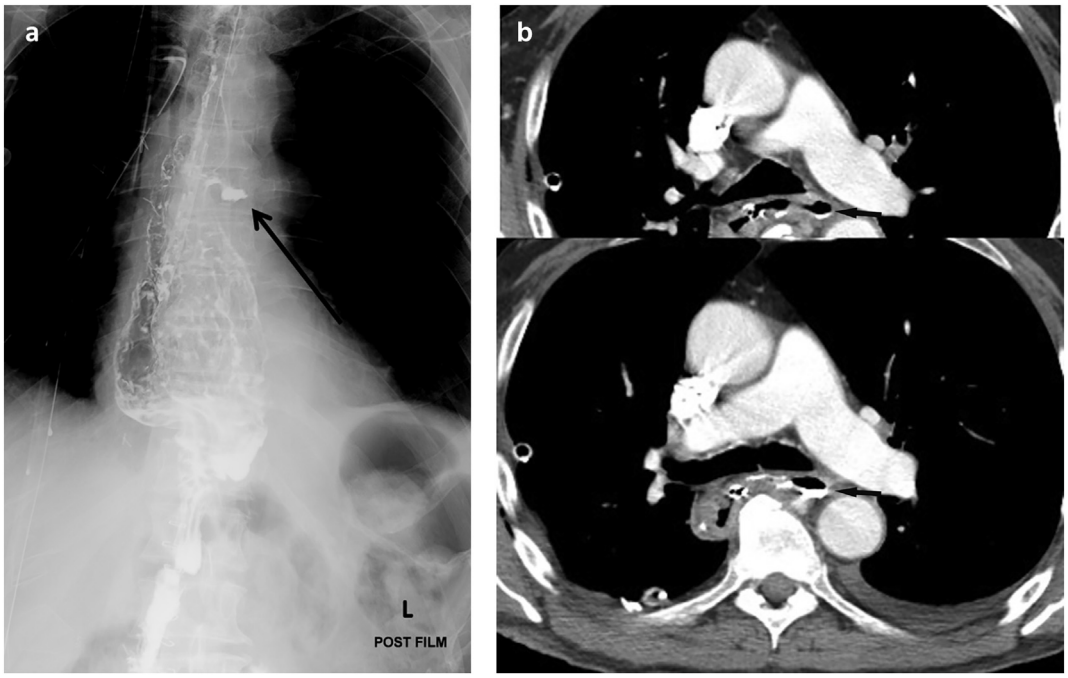

Fig. 1. a) Delayed SE view and b) CTELP axial image: Two sequential cone down axial images at the level of the pulmonary arteries. A small well sealed pocket of extravasated oral contrast on the left side of the mediastinum, is seen in both studies, near the anastomosis, in keeping with a small contained leak (arrows).

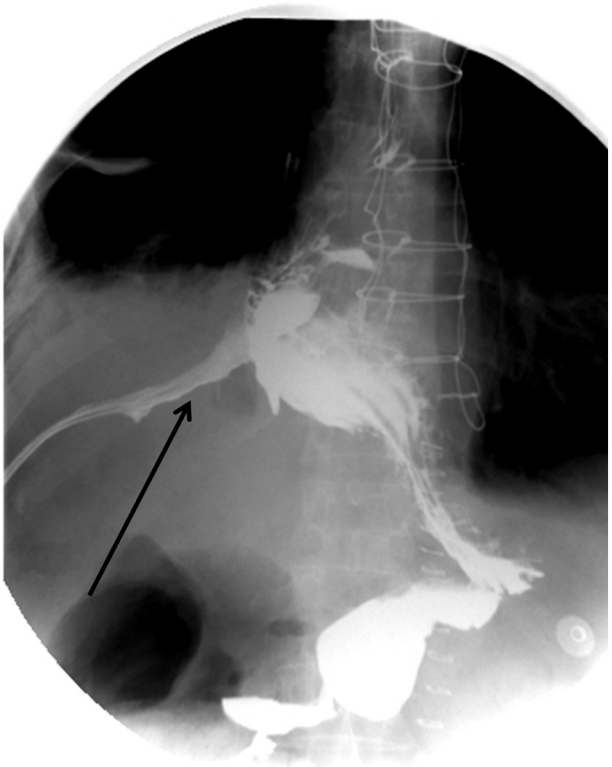

Fig. 2. Delayed SE, demonstrating a leak into the right pleural space, being drained by a chest tube, in keeping with a small contained leak.

Fig. 3. CTELP, cone down axial images at the right lung base (a–c), demonstrating the trajectory of the chest tube (arrows). There is radiodense material within the tube lumen (b–c), evidencing a small contained leak. No spillage of oral contrast was identified in the pleural fluid.

collaboration with the Thoracic Surgery Service at our institution, as two or more of the following: positive imaging reports confirmed by endoscopic evaluation, surgical findings, longitudinal follow-up data consistent with the suspected development of a conduit leak or any combination. We then classified the patients with a conduit leak according to the type of treatment implemented: Patients with type I