Alternatives to Traditional Per-Oral Endoscopy for Screening

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KEYWORDS

• Barrett's esophagus • Esophageal adenocarcinoma • Screening • Endoscopy
• Cell collection • Biomarkers • Transnasal endoscopy • Video capsule endoscopy

KEY POINTS

- Currently, diagnosis of Barrett's esophagus (BE) is dependent on endoscopy; however, this is not suitable for large-scale screening due to the invasive and expensive nature of the test.
- Less invasive tools such as transnasal and video capsule endoscopy are promising alternatives, but high costs are prohibitive for large-scale screening at the moment.
- Nonendoscopic screening methods are less invasive than endoscopic methods and can be more readily carried out in primary care, resulting in higher acceptability for patients.
- Large, randomized trials in the primary care setting are required to determine whether screening for BE is feasible and effective.

INTRODUCTION

The incidence of gastroesophageal reflux disease (GERD) has increased worldwide in the last 40 years.[1] One of the complications of GERD is Barrett's esophagus (BE), where esophageal squamous epithelium is replaced with columnar epithelium (metaplasia),[2] a process that can be viewed as a teleologic adaptation to reflux. BE predisposes patients to esophageal adenocarcinoma (EAC), a cancer with a very poor prognosis, carrying an overall 5-year survival of less than 15%.[3,4] Furthermore, the incidence of EACs has increased dramatically in high-income countries in the last 30 years.[5–7] Because GERD and obesity, which are the main risk factors linked to

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BE and EAC,[8–10] are still increasing, EAC rates have been projected to also further increase.[6]

More than 50% of EAC cases are diagnosed in patients with GERD, who are presenting with alarm symptoms when the cancer is typically advanced.[11,12] Furthermore, it is estimated that only 20% to 25% of patients with the premalignant condition BE are diagnosed. Hence, there is little chance of altering the population mortality from EAC through BE surveillance and endoscopic treatment regimens.[12,13] For those patients who are diagnosed with BE, the impact of surveillance programs is controversial.[11,14–16] However, when performed well, surveillance of BE patients can significantly improve EAC outcomes, including cancer-related mortality, especially more recently using outpatient-based endoscopic therapies for early disease, which obviate the requirement for surgical intervention.[17] The question therefore arises whether screening could reduce mortality from esophageal cancer. Screening should be aimed at detecting early stage cancer, when it is easier to treat, or precancerous stages, when development of cancer can be prevented by removing the precancerous lesion. Screening programs have already been implemented for several cancers, for example, cervical or breast cancer.

RATIONALE FOR SCREENING

To prevent esophageal cancer, screening would be aiming to detect BE. The evidence would suggest that such a program would be in line with the Wilson and Jungner[18] criteria for the selection of conditions suitable for screening:

- The condition should be an important health problem.
  - The incidence of EAC is increasing in the western world.[5–7]
  - The survival is less than 15% at 5 years.[3,4]
- There should a recognizable latent stage.
  - BE is a precancerous stage with a long natural history that can be recognized by endoscopy and biopsy.
- There should be suitable treatments available.
  - Endoscopic intervention, using endoscopic resection and ablation techniques, can prevent progression from dysplasia to carcinoma.[19,20]
- Early detection should lead to a more favorable prognosis.
  - Patients with EAC diagnosed at an early stage (1 and 2) have a far better survival than patients diagnosed at stage 3 or 4.[3,21]
  - Evidence is currently not conclusive whether individuals diagnosed through surveillance programs experience improved survival.[12]

The magnitude of the problem is likely to be large because between 3% and 6% of individuals with GERD are estimated to have BE.[22] Therefore, in order to identify this number of cases, an affordable screening strategy, which is acceptable to the relevant population, is required. Currently, diagnosis of BE has been dependent on per-oral upper gastrointestinal endoscopy (EGD); **Fig. 1**A, for example, shows a diagnostic image. However, this is not suitable for population screening because of the invasive and expensive nature of the test. EGD not only costs on average £650 or $866 per patient[23] but also incurs indirect costs due to patients having to take time off work and require being accompanied.[24]

CURRENT GUIDELINES FOR DIAGNOSIS OF BARRETT'S ESOPHAGUS

The latest guidelines for the diagnosis of BE by the American College of Gastroenterology (ACG), British Society of Gastroenterology (BSG), Danish Society for