INNOVATION EXCHANGE AMSTERDAM

Collaboration Opportunity




Barrett's esophagus cancer: high-throughput biomarker testing on patient material

Diagnostics, Barrett's, Oncology, Biobank, patients 2015

Background

Research group

The esophageal research team of the Academic Medical Centre Amsterdam (AMC) is one of the leading research groups in the field of endoscopic detection and treatment of early (Barrett) neoplasia of the esophagus.

Barrett's esophagus and cancer risk

Esophageal cancer is the sixth most common cause of cancer death worldwide, with an estimated number of 407,000 deaths in 2008.1 In the Western world the majority of diagnosed esophageal cancers are adenocarcinomas and with a 6-fold rise in incidence over the past 25 years, this is the cancer with the fastest rising incidence in the Western world. Unfortunately prognosis remains poor with a 5-year survival of ~15%, as most patients are diagnosed at an advanced stage.

Most adenocarcinomas develop from Barrett's esophagus (BE); a condition in which the normal squamous epithelium of the esophagus is replaced by columnar epithelium containing goblet cells, called intestinal metaplasia. BE is considered pre-malignant and progression to cancer is thought to occur through a series of cellular changes which can be seen on microscopy. The risk of developing cancer is ~100x higher than that of the normal population. Endoscopic surveillance is therefore recommended for all BE patients to detect cancer at an early and curable stage. However, endoscopic surveillance has its limitations. The progression rate to cancer is relatively low (0.5% per year), and the endoscopic procedures are expensive and uncomfortable to patients. Despite the fact that the cost-effectiveness of BE surveillance is questioned it is widely practised. Annual expenditure in the US for BE surveillance is estimated at 200 million dollar.

The Technology

Our study objectives

To identify markers for malignant progression in BE using archive paraffin slides of 300 patients who progressed to early BE neoplasia matched 1:4 with non-progressors and to validate findings in an independent prospective cohort of BE patients.

Biomarkers that predict malignant progression can be used to identify patients with an increased risk for developing cancer in their BE. These patients can then be scheduled for intensified endoscopic surveillance, or they may undergo prophylactic ablation of their BE segment. In patients with a low or minimal risk to develop cancer, surveillance intervals may be prolonged or even omitted.

Applications

What does our research group have to offer?

Over the past years, we have collected patient data and patient materials of large cohorts of patients with BE. Each cohort of patients has its unique characteristics.

1. The progressor cohort consists of over 300 patients who have been treated endoscopically for early Barrett's cancer and who have a surveillance history of more than 2 years prior to their cancer diagnosis. This cohort is unique for the number of patients and the interval between baseline diagnosis (absence of neoplasia) and progression to cancer.
2. The registration cohort of 10 community hospitals within the Amsterdam region consists of an estimated 4,500 patients. This cohort allows for the identification of non-progressors matched according to sex, age, and length of follow-up to the progressor cohort in a 4:1 ratio.
3. An independent prospective Barrett's surveillance cohort in Reference List 6 community hospitals of the Amsterdam region. This cohort consists of 1,200 patients, who have been followed for more than 5 years in a prospective manner. In these six community based hospitals, a dedicated Barrett's surveillance program is scheduled every 4-6 weeks and high-quality data collection is ensured by the presence of research nurses, operating from the AMC, at every endoscopy program. This cohort is followed independently from the aforementioned cohorts and allows for independent validation of biomarkers discovered in the first phase of the project.

To ensure a homogeneous registration of data, a dedicated and secured web-based Barrett's database is used to register all patient data.

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Ethical and legal use of patient data and paraffin material is ensured: we have obtained IRB approval from each of the 25 participating hospitals and Material Transfer Agreements with all pathology labs and hospitals have been signed. In addition, informed study consent is available from all patients.

What are we looking for?

In order to perform biomarker research on our valuable collection of paraffin-material, we are looking for a partner to perform high-throughput biomarker testing on only a small amount of paraffin-embedded material.

Key Publications

Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer 2010;127:2893-2917.

Pohl H, Welch HG. The role of overdiagnosis and reclassification in the marked increase of esophageal adenocarcinoma incidence. J Natl Cancer Inst 2005;97:142-146.

Gillison EW, Powell J, McConkey CC, Spychal RT. Surgical workload and outcome after resection for carcinoma of the oesophagus and cardia. Br J Surg 2002;89:344-348.

Hulscher JB, Tijssen JG, Obertop H, van Lanschot JJ. Transthoracic versus transhiatal resection for carcinoma of the esophagus: a meta-analysis. Ann Thorac Surg 2001;72:306-313.

Tschanz ER. Do 40% of patients resected for barrett esophagus with high-grade dysplasia have unsuspected adenocarcinoma? Arch Pathol Lab Med 2005;129:177-180.

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