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Original Research

Needle biopsy through the abdominal wall for the diagnosis of gastrointestinal stromal tumour – Does it increase the risk for tumour cell seeding and recurrence?

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Abstract ***Purpose:*** Preoperative percutaneous transabdominal wall biopsy may be considered to diagnose gastrointestinal stromal tumour (GIST) and plan preoperative treatment with tyrosine kinase inhibitors when an endoscopic biopsy is not possible. Hypothetically, a transabdominal wall biopsy might lead to cell seeding and conversion of a local GIST to a disseminated one. We investigated the influence of preoperative needle biopsy on survival outcomes. ***Methods:*** We collected the clinical data from hospital case records of the 397 patients who participated in the Scandinavian Sarcoma Group (SSG) XVIII/Arbeitsgemeinschaft Internistische Onkologie (AIO) randomised trial and who had a transabdominal fine needle and/or core needle biopsy carried out prior to study entry. The SSG XVIII/AIO trial compared 1 and 3 years of adjuvant imatinib in a patient population with a high risk of GIST recurrence

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after macroscopically radical surgery. The primary end-point was recurrence-free survival (RFS), and the secondary end-points included overall survival (OS).
Results: A total of 47 (12.0%) out of the 393 patients with data available underwent a percutaneous biopsy. No significant difference in RFS or OS was found between the patients who underwent or did not undergo a percutaneous biopsy either in the entire series or in subpopulation analyses, except for a statistically significant RFS advantage for patients who had a percutaneous biopsy and a tumour ≥10 cm in diameter.
Conclusion: A preoperative diagnostic percutaneous biopsy of a suspected GIST may not increase the risk for GIST recurrence in a patient population who receive adjuvant imatinib after the biopsy.

1. Introduction

The risk of recurrence of localised gastrointestinal stromal tumour (GIST) after surgery is frequently estimated with risk factors, most commonly with tumour mitotic count, size, and site of origin (whether gastric or non-gastric) [1]. Besides these factors, tumour rupture that occurs either prior to or during surgery is also considered an established risk factor for recurrence [1]. Whether a preoperative percutaneous fine needle or core needle tumour biopsy also carries an increased risk for GIST recurrence is unknown, and this question has remained controversial.

GIST is often suspected at computerised tomography (CT) or magnetic resonance imaging (MRI) of the abdomen, but there are several other tumours that may resemble GIST in imaging and are treated differently. Lymphomas, germinal cell cancers and extraskeletal Ewing's sarcoma are examples of tumours that are primarily treated with chemotherapy. Fibromatosis (desmoid tumour), in turn, is often primarily managed with a wait-and-see strategy. Thus, an accurate preoperative histopathological diagnosis may prevent inappropriate surgery.

In selected cases preoperative imatinib treatment may reduce tumour size and facilitate surgery, especially when GIST is located in the rectum [2,3] or when gastric GIST is large in size [4]. Preoperative imatinib may allow organ sparing and preserve the gastrointestinal tract function and continuity. A tissue sample prior to starting neoadjuvant imatinib is considered mandatory for verification of the diagnosis and carrying out mutational testing, as a small proportion of GISTs harbour a mutation that renders it imatinib-insensitive [5].

An endoscopic biopsy is often preferred, but in many cases a percutaneous transabdominal wall needle biopsy is needed to obtain enough tissue material. Hypothetically, a transabdominal wall biopsy could lead to GIST seeding into the abdominal cavity and conversion of a local disease to a disseminated one, but no estimations for the size of such a risk have been presented so far. Similarly, it is unknown whether a fine needle biopsy carries a smaller risk for seeding than a core needle biopsy, which often provides enough tissue material for mutation analysis.

International consensus guidelines on GIST are rather vague in recommending a biopsy. The guidelines both recommend or accept performing a percutaneous biopsy if an endoscopic biopsy is not feasible, but, on the other hand, warn for the potential consequences. Thus, the ESMO/European Sarcoma Network Working Group guidelines state that 'The risk of peritoneal contamination is negligible if the procedure is properly carried out. Moreover, lesions at risk in this regard (e.g. cystic masses) should be biopsied only in specialized centers' [6]. The National Comprehensive Cancer Network guidelines of the United States of America point out that 'GISTs are soft and fragile tumours. EUS-FNA biopsy of primary site is preferred over percutaneous biopsy due to the risk for hemorrhage and intra-abdominal tumour dissemination' [7].

The purpose of the present study was to compare the risk of GIST recurrence between cohorts of patients who either underwent or did not undergo a tumour needle biopsy prior to surgery. To our knowledge, the present report is the first one that evaluates the effect of a needle biopsy on the risk of GIST recurrence.

2. Methods

2.1. Patients

We studied the risk of GIST recurrence related to preoperative needle biopsy within the context of the Scandinavian Sarcoma Group (SSG) XVIII/Arbeitsgemeinschaft Internistische Onkologie (AIO) trial that compared 1–3 years of adjuvant imatinib after radical surgery for high risk GIST [8]. The SSG XVIII/AIO trial is an open-label, multicentre, randomised phase III study, where 400 patients with operable GIST were recruited from 24 hospitals located in Finland, Germany, Norway and Sweden between February 4, 2004, and September 29, 2008 (clinicaltrials.gov