Endoscopic Incisional Technique for Histological Diagnosis of Gastric Subepithelial Lesions following EUS Evaluation

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Abstract

Objective: Tissue acquisition is the gold standard for diagnosis and characterization of gastric subepithelial tu-
mours (SETs). We present our experience with endoscopic incisional tissue acquisition (ITA) technique in hypoechoic SETs of the fourth layer at EUS examination.

Methods: The ITA technique was performed in 32 patients. The mean size of the lesions was 19 mm, and the gastric body was the most common location. The mean procedure time was 19 minutes; a mean of 4 biopsies per lesion were taken.

Results: Tissue samples were adequate for histological diagnosis in 30/32 cases (diagnostic yield 94%). The most frequent histological pattern was gastrointestinal stromal tumour in 20 cases. Surgical resection was performed in 12 cases, while the remaining patients were followed without additional therapy.

Conclusion: endoscopic ITA technique is a safe and effective sampling method for histological diagnosis of gastric SETs.

Keywords: Gastricsubepithelialtumours; Tissue acquisition; Endoscopic ultrasonography; EUS

Introduction

Gastric subepithelial tumours (SETs) are rare and usually detected incidentally during upper gastrointestinal endoscopy [1].

They include different types of lesions and differentiating between these lesions is crucial, since up to 20% of sub epithelial lesions may be neoplastic [1,2].

The treatment and the follow-up may vary not only according to the diameter of the lesions but also to other parameters such as the mitotic count and the exact histotype. In particular, gastrointestinal stromal tumours (GIST) are treated differently from other types of SETs [1]. The main goal of characterization is defining the nature of the “hypoechoic fourth layer lesion”.

Histology is the “gold” standard to differentiate between the different types of SETs. However, obtaining adequate samples of such lesions for histological diagnosis is often challenging. Standard endoscopic mucosal biopsies are rarely helpful and other techniques have been used for tissue diagnosis, including endoscopic ultrasound (EUS) with fine needle aspiration (FNA) or with fine-needle biopsy (FNB) with Trucut, and stacked biopsy, but the
Table 1: Demographic and clinical data of the recruited patients.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>32</td>
</tr>
<tr>
<td>Age (years) (range)</td>
<td>56 (18-70)</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>20/12</td>
</tr>
<tr>
<td>Location of the lesion</td>
<td>Cardia: 2, Fundus: 2, Body: 16, Antrum: 12</td>
</tr>
<tr>
<td>Size of the lesions (mean, mm) (range)</td>
<td>19 (18-24)</td>
</tr>
<tr>
<td>Procedure time (mean, minutes) (range)</td>
<td>19 (16-32)</td>
</tr>
<tr>
<td>Number of biopsies (mean) (range)</td>
<td>4 (3-7)</td>
</tr>
<tr>
<td>Advers events</td>
<td>1 (ulceration)</td>
</tr>
<tr>
<td>Pathological diagnosis</td>
<td>Gastrointestinal stromal tumors: 20, Leiomyoma: 10, Nondiagnostic: 2</td>
</tr>
<tr>
<td>Treatment</td>
<td>Observation: 10, Surgical resection: 22</td>
</tr>
<tr>
<td>Follow-up (mean, months) (range)</td>
<td>6 (3-9)</td>
</tr>
</tbody>
</table>

diagnostic efficacy of these appears to be limited [3-6].

Endoscopic resection of SETs allows to perform an accurate histological diagnosis, however, it requires long procedures and exposes patients to potentially serious complications, such as bleeding and perforation.

Less-invasive endoscopic techniques for tissue acquisition have been proposed, such as the EUS-guided single-incision needle-knife (SINK) biopsy, the unroofing technique using an electrocautery snare, the endoscopic biopsy using the endoscopic submucosal dissection (ESD) technique with “bloc biopsy” under a direct endoscopic view [7-10].

All these techniques have in common the incision of the mucosa with the exposure of the lesion and the direct sampling with forceps. Studies comparing the diagnostic yield of these techniques are lacking and it is unlikely that will be done in future. This is because of the difficulty in having a sufficient power due to the limited number of patients affected by this pathology and the impact of the operators skills on the choose of the sampling technique.

We report our experience with an endoscopic incisional tissue acquisition (ITA) technique in hypoechoic SETs originating from the fourth layer on EUS imaging, using an operative gastroscope to cut the mucosa and sample the lesion by forceps. This method, in our opinion, can be applied also in centers with less resources.

Methods

The interventional endoscopy database was reviewed retrospectively and all patients, between January 2012 and March 2016, which presented with an hypoechoic SETs originating from the fourth layer on EUS, and in which ITA technique was performed, were included in the study.

Data acquisition

Clinical data for eligible patients were obtained by reviewing all the available medical records regarding hospitalization and outpatient visits, including data from Endoscopy, Surgery and Oncology Departments, as well as from consultation of the laboratory, instrumental and pathological archives of our Institution.

The parameters evaluated in the study were: age,
gender, location, size of the lesions, procedure time, adverse events, pathological diagnosis, treatment and follow-up period.

Adverse events were defined as early and late (i.e. occurring < 7 days or ≥ 7 days after the procedure, respectively). The patients were assessed at the time of ITA and follow-up for adverse events was done by a telephone call at day 1, 7, 15 and 30 after the procedure.

Endoscopic procedures

All procedures (both EUS and ITA) were performed by an experienced interventional endoscopist (NP) and written informed consent for the performed procedures was obtained from all patients.

All the patients underwent EUS evaluation with a linear or radial echoendoscope (Olympus America Corp., Melville, New York, USA) under deep sedation in the interventional endoscopy suite. The ITA was performed using an operative gastroscope (Olympus America Corp., Melville, New York, USA) with a distal attachment. After choosing the most suitable area for sampling, an incision of the mucosal and submucosal layer was created by a needle-knife (a precut knife or a hook knife) to expose the lesion. Haemostasis was obtained by coagrasper or direct vessels coagulation by the electrosurgical knife.

After cutting the capsule, biopsy forceps were introduced through the incision under endoscopic control to sample the lesion. The number of biopsies was chosen by the endoscopist, evaluating the quality of the material upon every biopsy. At the end of the procedure, in order to prevent bleeding, argon plasma coagulation (APC) was applied to the area of sampling or the mucosal defect was closed by clip positioning. Patients were discharged after 2 hours of observation.

Results

A total of 32 patients (18 males; mean age, 56 years) were identified as eligible for the study and the demographic and clinical data are presented in table 1.

The mean lesion size was 19 mm (range 16 to 28 mm) and the most common location was the gastric body (16 cases). The mean procedure time was 19 minutes and a mean of 4 biopsies for lesion were done.

Tissue samples showed to be adequate for histological diagnosis in 30/32 cases (diagnostic yield 94%). The size of the specimen allowed immunohistochemical analysis and mitotic index determination and the immunopathologic studies showed that the most frequent histological pattern was GIST (20 cases).

In a 25 year-old man with a 24 mm lesion in the anterior wall of the antrum, the samples were inadequate for analysis and a laparoscopic resection was done with a definitive diagnosis of leyomioima.

Only one adverse event occurred three days after the ITA procedure was performed in a patient with a 18 mm leyomioima, who developed an ulceration in the site of biopsy, with a severe epigastric pain which required prolonged omeprazole therapy and eventually was completely reepithelialized after 2 months.

Surgical resection was performed in 22 cases, while the remaining 10 patients were followed without additional therapy. Over a mean follow-up period of 6 months (range 3 to 9) the survival rate was 100%.

Discussion

Tissue acquisition is mandatory for diagnosis and characterization of SETs, and histology with immunohistochemical analysis is the “gold” standard method used to differentiate between different types of SETs.

The diagnostic efficacy of EUS-FNA and EUS-trucut biopsy in these lesions appears to be limited. In a randomized study in patients with gastric GISTs, EUS-FNA and EUS-trucut biopsy showed an overall diagnostic accuracy of 52 and 55% respectively [3].

Tissue acquisition in SETs has been attempted also by using the bite-on-bite technique with biopsy forceps, but this technique has many limitations and tissue samples cannot be obtained in most of the cases [5].

Recently, endoscopic techniques for tissue acquisition have been proposed such as endoscopic ultrasound-guided single-incision needle-knife (SINK) biopsy. This technique uses a single incision, without submucosal dissection and direct visualization of the capsule, and provides good tissue specimens for evaluation (about 70%) without adverse events [7].

Also, other technique have been proposed, but they are all variation of the theme, all including mucosal incision and direct biopsy of the lesion. The unroofing
technique, snaring the lesion to cut a sample, provides a
good diagnostic yield but a high rate of bleeding has been
reported [8].

The “bloc biopsy” technique, using sub-mucosal
dissection, has been described. [9,10] This technique allows
to acquire a large specimen (about 5 mm in diameter)
in all patients with a 100% mitotic index evaluation rate.
However, the bloc biopsy technique is complex since it
requires advanced technical skill in ESD, as well as being
more expensive than other methods.

We present our experience with tissue acquisition
endoscopic technique for histological and
immunopathological diagnosis in patients with gastric
hypoechoic SETs originating from the fourth layer at EUS
imaging.

Compared with available studies, our results showed
that the ITA technique was effective for tissue acquisition,
allowing adequate sampling in 30 out of 32 cases with an
excellent diagnostic yield (94%). Using APC applied to the
area of sampling or closing the defect by clips at the end
of the procedure, prevented bleeding in all cases.

Although there are limitations to our study, such as
the relatively small number of included cases, single
endoscopist approach and retrospective design, and
the endoscopic incisional has shown to be an effective
and safe method for immunohistologic diagnosis of
hypoechoic SETs originating from the fourth layer of EUS
imaging.

Our data show that this technique can be performed
using a gastroscope and a needle knife. This could be an
option in endoscopic suites with less resources.

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