The value of CT diagnosis of hernia recurrence after prosthetic repair of ventral incisional hernias

Abstract  Herein we present a prospective study made to compare the diagnostic value of a physical examination and a CT scan in the detection of a hernia relapse after carrying out of an intraperitoneal hernioplasty using a non-resorbable mesh. Fifty patients operated on for intraperitoneal hernioplasty with ePTFE mesh and postoperative symptomatology were assessed within a year of the operation via a physical exploration and CT. Each of the patients was subjected to an exploratory laparoscopy for the purpose of confirming the diagnosis. The data were analysed statistically using a chi-square test, sensitivity, specificity, confidence limits, positive predictive value, and negative predictive value. The hernia relapse was correctly diagnosed in 98% of cases by CT and in 88% of cases in the physical examination. The sensitivity was 1 in the CT examination and 0.75 in the physical examination, and the specificity results were 0.97 and 0.90, respectively. The positive predictive value in the CT exam was 0.88, whereas in the physical examination it was 0.60. The negative predictive values were 1 and 0.95, respectively. The differences between the values of both methods held a statistical meaning (chi-square test; \( p < 0.05 \)). The postoperative assessment by CT of symptomatic patients who have been operated on for an intraperitoneal hernioplasty with unabsorbable mesh facilitates carrying out a correct diagnosis in the detection or exclusion of hernial relapse.

Key words  CT · Incisional hernia · Abdominal wall hernia

Introduction

Although tension-free repair with non-resorbable mesh of the postlaparotomy hernia has considerably reduced the incidence of relapses [1], between 1 and 10% of patients have suffered from a new incisional hernia [2, 3]. The majority of postlaparotomy hernias are easily diagnosed by inspection and palpation. However, after a hernioplasty, the existence of the non-resorbable mesh and the fibrosis that accompanies it may complicate its clinical diagnosis or render it impossible. Obesity, abdominal distension or a spontaneous contraction of the abdominal wall are factors which may make its detection difficult during physical examination. In these circumstances, evaluation of the abdominal wall by a CT may provide a correct diagnosis of the hernia relapse [4, 5].

We present a prospective study, the aim of which was to compare the diagnostic value of physical examination and CT in detection of hernia relapse after carrying out an intraperitoneal hernioplasty using non-resorbable mesh.

Materials and methods

Fifty patients operated on for incisional hernia were assessed within a year of the operation due to the presence of pains in the
abdominal wall or detection of a tumour in the laparotomy scar-
ring. Thirty-two of the patients were women and 18 were men, with
an average age of 58 years (age range 38–77 years). The operating
technique in each case consisted of the intraperitoneal placement of
an ePTFE mesh (MycroMesh Biomaterial, 10 × 15 or 15 ×
19 cm, 1 mm thick; Gore and Associates, Flagstaff, Ariz.), sutured
5 cm from the hernial ring.

The assessment consisted of an exhaustive abdominal palpa-
tion and, with prior consent of the patient, a CT scan. The CT was
always carried out by the same radiologists, without prior infor-
mation on the location of the inserted mesh, nor of the findings
obtained from the physical exploration.

The CT scans were performed with a CT scanner, CT Sytec
3000 (GE Medical Systems, Milwaukee, Wis.). Firstly, conven-
tional CT scans through the total abdomen were done with 10-mm
slice thickness at 10-mm intervals. Additional thin-section CT
scans, usually 10–15 scans, were performed through the mesh with
5-mm collimation at 5-mm intervals, employing a standard algo-

Table 1 Physical examination and CT findings with regard to
findings at laparoscopic examination

<table>
<thead>
<tr>
<th></th>
<th>True positive cases</th>
<th>True negative cases</th>
<th>False positive cases</th>
<th>False negative cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>8</td>
<td>41</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Physical exam.</td>
<td>6</td>
<td>38</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Fig. 1 False positive of physical exploration. Intense fibrosis around the mesh

Fig. 2 False positive of physical exploration. Haematoma of fronal rectum

Results

The physical exploration detected in 10 patients a tu-
mour in the vicinity of the mesh, which was considered
as a hernial relapse. On six occasions the diagnostic was
correct, and in 4 there was a false positive. In 9 cases the
CT reported it as a hernial relapse, one of the cases being
a false positive. The findings of the physical examina-
tion of the patient and of the CT scan with regard to
the findings of the laparoscopic examination are shown
in Table 1.

The hernia relapse was correctly diagnosed using CT
in 98% of cases (95% confidence limits: 87–104%) and
in the physical examination in 88% of the patients
(95% confidence limits: 74–101%). The sensitivity was
1 in the examination by CT and 0.75 in the physical ex-
amination, and the specificity was 0.97 and 0.90, re-
spectively. The positive predictive value in the CT exam
was 0.88, whereas in the physical examination it was
0.60. The negative predictive values were 1 and 0.95,
respectively. Significant statistical differences existed in
the results obtained using each of these methods (chi-

Discussion

The use of prosthetic materials for the repair of inci-
sional hernias led to an important decrease in the inci-
dence of relapses [6, 7, 8, 9]; however, approximately