Duodenal perforation in course of endoscopic retrograde cholangiopancreatography-endoscopic sphincterotomy. Therapeutic considerations

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Introduction

Pancreatitis, cholangitis and, less frequently bleeding, are complications of endoscopic sphincterotomy (ES), which usually are managed with conservative therapy. Duodenal perforation, which is often retroperitoneal, presents more problems regarding choice of therapy: several therapeutic programs may be proposed, since often the initial lesion is not easily recognized and may vary. The aim of the study was to determine, with uniformity, the criteria of the therapeutic choice.

Material and method

In the period from October 1997 to December 2003, 101 ERCP were performed. In 90 cases ES was associated for therapeutic aims: 47 acute biliary pancreatitis (5 severe acute pancreatitis, 42 mild acute pancreatitis), 25 choledocholithiasis without pancreatic compromission and 18 cases of positioning an endoscopic stent in patients with non operable neoplastic pathology. However, ERCP often turned out to be only diagnostic, since lithiasis had in the meantime passed spontaneously. ERCP/ES were executed in two different centers of digestive endoscopy, outside our Department. We registered 5 duodenal perforations (4.95%). In these cases, the initial pathology, the radiological picture of the ERCP, computer tomography (CT) control and the post-ERCP clinical picture were evaluated in order to establish the therapeutic program.
In two patients indication of ERCP/ES was acute pancreatitis; there was no evidence of radio-contrast leakage during the examination, but signs of perforation, evidenced by retropneumoperitoneum during a CT scan, performed some days after ERCP (carried out for morphological evaluation of the acute pancreatitis). A conservative therapeutic approach was used in these patients: positioning of a nasal-gastric tube for some days and suspending oral alimentation. In both patients the clinical evolution was completely favorable. In the other three patients, also affected by acute biliary pancreatitis, radio-contrast leakage was observed during ERCP; the immediate radiological and CT controls showed retropneumoperitoneum and the persistence of the contrast leakage. These patients also had presented fever (38.5°C in mean) and upper abdominal pain during the last hours before the subsequent operation. These three patients were submitted to urgent surgical intervention of cholecystectomy, external biliary drainage, gastric-enteric-anastomosis (GEA) and duodenostomy with a Foley catheter.

Results

The results of both therapeutic choices were fully favorable: there was no mortality nor development of retroperitoneal septic collections. Oral alimentation was resumed in all cases on 8th day. Specific complications occurred in the operated patients after the 3rd week: one episode of post-operative vomiting and electrolyte unbalance, and in one case stenosis of the afferent jejunal loop of the GEA after 4th week necessitating another surgical intervention.

In patients treated with conservative therapy, the nasal-gastric tube was removed on 8th day. External biliary drainage and the duodenostomy were removed during 4th week. These data are shown in Table I.

Discussion

In the past, the incidence of post-ERCP/ES complications was evaluated to be about 10%1-3; such complications referred to perforation, pancreatitis, cholangitis and bleeding. In literature post-ERCP perforation is about 1%.

Perforative complications have 2 aspects which are yet to be clarified: is it necessary to distinguish minimal perforations from real lacerations thus facilitating therapeutic intervention? The second aspect still open to debate is how to define risk factors so as to allow for efficacious prevention.

The complications of the medical procedures cannot be completely eliminated; moreover, it is important to identify the risk factors in order to lower risk rates. As regards to duodenal perforations in course of ERCP/ES, we can refer to physiopathologic conditions, such as Oddi sphincter dysfunction, biliary duct dilation, the technical difficulties of the performed maneuvers: the necessity to perform the pre-cut, the use of a guide-wire, many attempts to complete the examination, or the presence of biliary stenosis to be dilated. Finally, in the prevention of the ERCP complications, we can conclude that a key role is given to the technical skill and to the identification of the cases at risk 4-6.

The surgical problem referred to the duodenal perforative post-ERCP complication is today basically modified thanks to the anatomical-clinical differentiation of the cases before any operative decision.

In fact, in the past, without the anatomo-clinical evaluation, there was an extensive application of the surgical indication, that, in some cases, implied overtreatment.

The selective therapeutic approach offers two options: urgent surgical intervention and conservative therapy 7.

The decision of the therapeutic program depends on clinical and diagnostic criteria. The clinical scenario may be very variable, comprehending clinical signs and symptoms of generalized peritonitis or normal conditions of the abdominal objectivity, without pain or fever. As is well known ES may on its own reactivate pancreatitis and cause abdominal pain with de novo induced a further increase of the specific laboratory parameters: this condition must be differentiated from the perforative scenarios. The variability of the clinical

Table I – Results of management of 5 perforations in course of ERCP/ES

<table>
<thead>
<tr>
<th></th>
<th>Surgical therapy in urgency</th>
<th>Conservative therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retro or endoperitoneal septic gatherings</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mortality</td>
<td>7th day</td>
<td>8th day</td>
</tr>
<tr>
<td>Resumption of the alimentation</td>
<td>1</td>
<td>8th day</td>
</tr>
<tr>
<td>Efferent loop stenosis in GEA</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Vomitus from electrolyte unbalances</td>
<td>1</td>
<td>8th day</td>
</tr>
<tr>
<td>Removal of the nasal-duodenal drainage</td>
<td>4th week</td>
<td>4th week</td>
</tr>
<tr>
<td>Removal of the external biliary drainage</td>
<td>4th week</td>
<td>–</td>
</tr>
<tr>
<td>Removal of the duodenostomy</td>
<td>–</td>
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picture is definitely determined by the location (retro
or intraperitoneal), and by the size (true laceration or
simple pointform lesion), of the duodenal perforation.
The radiological and ultrasonographic data are funda-
mental to program the therapeutic choice. Besides, we
must consider that in many cases the diagnosis was
made during the examination at the moment of the
injection of the contrast media. In our experience, this
last event occurred in three of the five patients. In the
remaining two patients there was no evidence of con-
trast leakage during the examination, and the silent cli-
nical scenario did not lead to specific exams (radio-
contrast examination of the upper intestinal tract).
In fact, the diagnosis was made some days later, during
CT-scan (with oral and intravenous radiocontrast) that
had been programmed to control the evolutive mor-
logic scenario of the pancreatitis. In both patients the
conservative medical therapy was programmed and it
was identical to our usual dietetic-therapeutic prescrip-
tions for acute pancreatitis and for the post-ERCP/ES
phase: suspension of alimentation, antibiotic therapy,
gabesate mesilate, somatostatin.
Thus, the conservative therapy is chosen when clinical
findings are negative and there are no signs of incipient
sepsis. Furthermore, patients with a minimal retroperi-
toneal perforative lesion are eligible for only a medical
therapy when there is a minimal radiocontrast leakage
during the ERCP, and when contrast agent disappears
in a short time upon radiographic control.
In all the other conditions, in our opinion, the urgent
surgical intervention is to be considered: relevant when
retroperitoneal contrast leakage persists and the lesion is
intraperitoneal even if small. Duodenal wall lacerations,
even if small, in any case should be operated. In these
cases we believe that waiting for the first signs of sepsis,
in order to avoid the surgical operation, is very risky. In
fact, in these cases, risk of sepsis is high and then dif-
ficult to control.
Of fundamental importance in this perspective is that
clear criteria should be defined for a timely decision
when to operate.
We completely agree with the following points shown
by Stapler ?: persistent contrast leakage during ERCP;
that is during the radiological examination of the sto-
mach-duodenum (with hydro-soluble radiocontrast),
within 2 to 8 hours from the ERCP; CT-scan demon-
stration of intra or retroperitoneal contrast spreading,
massive subcutaneous emphysema; persistence of intra-
choledoch material, such as stones, Dormia basket, etc.
On the other hand this choice of therapy is not advi-
sable for patients in whom perforation has been demon-
strated, but the clinical data (peritoneal signs, fever,
leukocytosis, etc.) are considered negligible.
The other point of discussion concerns the timing and
the choice of the surgical treatment. If necessary the sur-
gical intervention must be immediate, as is the case for
the perforation of the cave organs. Conservative therapy
is justified only for retroperitoneal or pointform perfor-
ations, with minimal contrast leakage.
In the doubtful cases, where a septic evolution is to be
expected, non-surgical medical therapy is not acceptable,
but on the contrary it is preferable to program the sur-
gical intervention in emergency.
The choice of the type of surgical intervention to treat
the perforation depends from the kind of anatomical
lesion.
The great lacerations may need a local revision, in order
to suture the lesion. But, this therapeutic moment is, in
our opinion, in most other cases unnecessary, and perha-
ps harmful.
Generally these are little perforations which are the result
of the pre-cut or a false path of the catheter or of the
guide wire into the retroperitoneum. In this condition
duodenum mobilization could cause an intraperitoneal
perforation.
So, excluding the rare cases of major lacerations, we think
that it is useful not to directly treat the site of the perfo-
ration. But in both cases the surgical treatment should
be completed by the duodenal transit exclusion with a
gastric-enteric-anastomosis (GEA), by duodenostomy and
external biliary drainage if there is dilatation of the prin-
cipal biliary duct, and finally peri-duodenal drainage. In
this way the alimentation can be restarted at the end of
the first week, while the duodenostomy and the exter-
nal biliary drainage should be removed by 4th week.
Our therapeutic choices, based on the criteria for selec-
tion of the patients above indicated, did not register fai-
lures as to the development of septic collections.
The clinical and instrumental scenario is not reliable,
because it does not allow for a detailed and precocious
selection of the patients, since, if it is positive (perito-
neal signs, even if minimal and circumscribed, fever,
etc.), it will foresee surgery, but it could be quite late
if there retroperitoneal leakages have occurred, dangerous
septic collections could follow.
Then the trend of our choices is decisively for an early
surgery because a perforation which is not treated sur-
gically is at high risk and could have an unfavorable evo-
lution. In these cases late surgical intervention is often
inefficacious.
In our experience the presence of a minimal lesion in
the two patients became evident by the clinical evolu-
tion and by the signs shown during routine diagnostic
control.

Conclusions

Patients should be selected on the basis of the anatomic
kind of perforation, and on the basis of indirect data,
supplied by both the contextual radiological study during
the examination, and, immediately afterwards, by a CT-
scan study.
If the clinical and instrumental evaluation of the patients
shows an intraperitoneal perforation or if there is the evident and persistent leakage of the radio-contrast in the retroperitoneum the surgical intervention must be programmed at once. On the contrary, the cases with a minimal lesion and negligible or absent retroperitoneal contrast leakage, without any modification of the clinical findings, must be conservatively treated.

In our experience these proposed treatments of duodenal perforation in course of ERCP was efficacious and safe, and always avoided every risk of septic evolution.

Riassunto

La pancreatite, la colangite e in misura minore il sanguinamento sono complicanze della sfinterotomia endoscopica che in prima istanza sono gestibili con terapia conservativa e spesso in tal modo vanno a risoluzione. La perforazione duodenale, molto spesso retroperitoneale, pone sicuramente maggiori problemi di scelta terapeutica: il quadro clinico spesso non univoco, la lesione iniziale non ben conosciuta e comunque variabile, la possibilità indefinita di autolimitazione del quadro anatomo-clinico lasciano proponibili diversi programmi terapeutici. Lo scopo dello studio è di determinare in modo uniforme i criteri della scelta terapeutica.

References


