Short report

Medico-legal considerations in a case of splenic injury that occurred during colonoscopy

Chiara Zandonà MD, Forensic Physician, Stefania Turrina PhD, Forensic Scientist*, Nicole Pasin MD, Forensic Physician, Domenico De Leo MD, Professor, Director

Department of Public Health and Community Medicine, Institute of Legal Medicine, University of Verona, Policlinico G.B. Rossi, P.le L.A. Scuro 10, 37134 Verona, Italy

ARTICLE INFO

Article history:
Received 28 April 2011
Received in revised form 8 November 2011
Accepted 27 December 2011
Available online 13 January 2012

Keywords:
Colonoscopy
Splenic injury
Complication
Medical professional liability

ABSTRACT

Colonoscopy has become the gold standard diagnostic and therapeutic treatment for rectum and colon diseases. The splenic injury is a rare complication of colonoscopy and relatively few cases (less than 70) have been reported in the literature so far. Here we present a case of splenic rupture identified in an 80-year-old man few hours after an apparently uneventful colonoscopy. Acknowledging a causal relationship between the lesion and the diagnostic procedures, we discuss the possible medico-legal implications with regard to professional liability considering the exceptional nature of such an event and the stance recently taken by the Italian law.

1. Introduction

Colonoscopy is a relatively straightforward procedure introduced in the 1960s, that has gradually gained an important role both as a diagnostic and therapeutic procedure, and in the follow-up of colorectal diseases. It is currently considered a routine practice and is generally well tolerated by patients. It is an invasive test, nonetheless, even used for purely diagnostic purposes, and it is not without complications, the most common being perforation of the intestinal wall (0.34–2.14%) and bleeding (1.8–2.5%), while the less common include visceral lesions such as pneumothorax, pneumoperitoneum, acute appendicitis and retroperitoneal abscess.

Another, exceptionally rare but potentially lethal complication of the procedure is represented by splenic lesions, particularly when these occur in the absence of intestinal wall lesions. This complication was first described in 1974 by Werry and Zhener and only a few dozen such cases have been reported in the international literature so far (with 68 cases known to date, see Table 1).

In this report, we describe a case of splenic injury following colonoscopy and discuss the possible professional liability considering the stance recently taken by the Italian law.

2. Case report

The case concerns an 80-year-old male with a past medical history of hypertension, aortic valve replacement, surgery for abdominal aorta aneurysm, and resection of a colorectal neoplasm. Moreover, he had been treated with anticoagulants and antihypertensive drugs for many years. On July 2008, he underwent a colonoscopy follow-up for his colorectal neoplastic disease during which biopsies were performed. The colonoscopy was completed without encountering any intraoperative difficulties and the patient felt well with no complications upon routine discharge.

Few hours post-procedure, the patient developed the onset of widespread abdominal pain, profuse perspiration and syncopal episodes. He was taken to emergency room, he denied abnormality in his bowel movements and his observations were all within normal limits. His heart rate was 85 beats/min, his blood pressure was 110/65 mmHg and his hemoglobin was 12.3 mg/dl. Therefore, based on the patient’s medical history a diagnosis of "cardiac insufficiency and acute renal insufficiency" was established and he was hospitalized in the department of geriatrics.

Because of his progressive worsening over the next two days, laboratory tests demonstrated anemia (hemoglobin level was dropped to 6.7 mg/dl), an abdominal computed tomographic (CT) scan was performed. It revealed: “… a conspicuous area of hemoperitoneum and an enlarged spleen with a morphology disrupted by the presence of hypodense infra-parenchymal conglomerates of..."
<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>Sex</th>
<th>Procedure</th>
<th>Symptom onset</th>
<th>Time to diagnosis</th>
<th>Treatment</th>
<th>Outcome</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>data unavailable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wherry et al</td>
</tr>
<tr>
<td>1977</td>
<td>53</td>
<td>F</td>
<td>Colonos</td>
<td>&lt;24 h</td>
<td>3 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Telmos et al</td>
</tr>
<tr>
<td>1979</td>
<td>33</td>
<td>F</td>
<td>Colonos</td>
<td>4 h</td>
<td>3 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Ellis et al</td>
</tr>
<tr>
<td>1986</td>
<td>71</td>
<td>F</td>
<td>Colonos</td>
<td>24 h</td>
<td>1.5 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Castelli</td>
</tr>
<tr>
<td>1987</td>
<td>50</td>
<td>F</td>
<td>Colonos</td>
<td>6 h</td>
<td>1 day</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Levine et al</td>
</tr>
<tr>
<td>1989</td>
<td>60</td>
<td>F</td>
<td>Polypectomy</td>
<td>6 h</td>
<td>&lt;1 day</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Gores et al</td>
</tr>
<tr>
<td>1990</td>
<td>62</td>
<td>F</td>
<td>Colonos</td>
<td>2.5 days</td>
<td>5 day</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Merchant et al</td>
</tr>
<tr>
<td>1991</td>
<td>74</td>
<td>M</td>
<td>Polypectomy</td>
<td>&lt;1 day</td>
<td>8 day</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Rockey et al</td>
</tr>
<tr>
<td>1992</td>
<td>90</td>
<td>F</td>
<td>Colonos</td>
<td>6 h</td>
<td>1.5 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Reynolds et al</td>
</tr>
<tr>
<td>1993</td>
<td>82</td>
<td>M</td>
<td>Polypectomy</td>
<td>8 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Zilian et al</td>
</tr>
<tr>
<td>1994</td>
<td>68</td>
<td>M</td>
<td>Colonos</td>
<td>&lt;24 h</td>
<td>6 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Ong et al</td>
</tr>
<tr>
<td>1995</td>
<td>36</td>
<td>F</td>
<td>Colonos</td>
<td>2 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Green et al</td>
</tr>
<tr>
<td>1996</td>
<td>48</td>
<td>F</td>
<td>Polypectomy</td>
<td>10 h</td>
<td>1.5 days</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Espinal et al</td>
</tr>
<tr>
<td>1997</td>
<td>72</td>
<td>F</td>
<td>Polypectomy</td>
<td>8 h</td>
<td>&lt;1 day</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Tse et al</td>
</tr>
<tr>
<td>1998</td>
<td>50</td>
<td>F</td>
<td>Colonos</td>
<td>6 h</td>
<td>6 h</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Bergamaschi et al</td>
</tr>
<tr>
<td>1999</td>
<td>36</td>
<td>F</td>
<td>Colonos</td>
<td>1 h</td>
<td>2 h</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Reissman et al</td>
</tr>
<tr>
<td>2000</td>
<td>116</td>
<td>M</td>
<td>Polypectomy</td>
<td>&lt;12 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Rockey et al</td>
</tr>
<tr>
<td>2001</td>
<td>70</td>
<td>F</td>
<td>Colonos</td>
<td>4 days</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Dumin et al</td>
</tr>
<tr>
<td>2002</td>
<td>80</td>
<td>F</td>
<td>Colonos</td>
<td>48 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Ahmed et al</td>
</tr>
<tr>
<td>2003</td>
<td>64</td>
<td>M</td>
<td>Colonos</td>
<td>6 h</td>
<td>6 h</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Bergamaschi et al</td>
</tr>
<tr>
<td>2004</td>
<td>52</td>
<td>F</td>
<td>Colonos</td>
<td>2 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Reissman et al</td>
</tr>
<tr>
<td>2005</td>
<td>80</td>
<td>F</td>
<td>Colonos</td>
<td>1 h</td>
<td>2 h</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Gordan et al</td>
</tr>
<tr>
<td>2006</td>
<td>66</td>
<td>M</td>
<td>Colonos</td>
<td>&lt;12 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Wald et al</td>
</tr>
<tr>
<td>2007</td>
<td>12</td>
<td>F</td>
<td>Colonos</td>
<td>24 h</td>
<td>&lt;24 h</td>
<td>Spleenectomy</td>
<td>Uncomplicated</td>
<td>Tse et al</td>
</tr>
<tr>
<td>2008</td>
<td>35</td>
<td>F</td>
<td>Colonos</td>
<td>&lt;12 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Zilian et al</td>
</tr>
<tr>
<td>2009</td>
<td>63</td>
<td>M</td>
<td>Colonos</td>
<td>&lt;24 h</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Rockey et al</td>
</tr>
</tbody>
</table>

Colonos = colonoscopy; Polypectomy = polypectomy; Spleenectomy = splenectomy; Conserv = conservative; Uncomp = uncomplicated.

* Details were not provided in some cases.
available documentation, the differential diagnosis of the clinical presentation in the first two cases is straightforward, as shown in Table 1. Reported cases of splenic rupture in the immediate postoperative period, with a low complication rate, among these the most common are those of the colon and splenic angle. The postoperative period was uneventful and the patient was discharged a few days later.

A few months later, the case came under the observation of our medical-legal department when the patient made a claim for €100,000 in damages for the temporary and permanent consequences of the splenectomy.

3. Discussion

The use of colonoscopy in the follow-up of intestinal disease is well established and the procedure is very simple to perform and has a low complication rate, among these the most common are perforation and bleeding resulting from biopsies and polypectomies. The traumatic rupture of the spleen as a consequence of colonoscopy is an unusual occurrence and only for a few cases (less than 70, as shown in Table 1) reported in the international scientific literature a causal relationship with colonoscopy has been recognized. In such situations, the problem of establishing any medical professional liability lies specifically in the paucity of available documentation, the difficulty of clearly identifying the pathogenic mechanisms behind such an event, and the shortage of data on potential risk factors that might contribute to injuring the splenic ligament and parenchyma.

To date, the mechanisms determining splenic injury have yet to be fully elucidated. Pathological events that can occur mainly concern the rupture of the splenic capsule, with a consequent destruction of the portion of parenchyma adhering thereto and the development of subcapsular or intraparenchymal hematomas. As for the possible pathogenesis of the injury, some authors have suggested that this might be facilitated by pre-existing anatomic anomalies of the splenic ligaments anchoring the spleen in the upper left abdominal quadrant. If ligaments are shorter than normal, their excessive traction could lead to rupture of the splenic capsule and the same could be said of maneuvers inducing torsional strain on the splenocolic ligament. As concerns the potential causal role of endoscopic investigations, the emphasis has been placed on direct trauma induced by the endoscopic instrument transiting at splenic flexure level, and/or an excessive tensile stress on the splenocolic ligament during the endoscopic procedure, both mechanisms possibly exacerbated by tissue adhesions between the spleen and the colon due to previous surgical procedures or inflammatory processes. An increase in the pressure exerted directly on the abdominal wall during the colonoscopy has also been indicated as a potential cause for this type of lesion.

Reviewing the published reports, it becomes clear that most cases of splenic lesions became manifest with pain in the upper left quadrant and radiating to the homolateral shoulder (Kehr’s sign). There is only one case of a patient reporting no painful symptoms at all in the interval between the invasive test’s performance and the radiological confirmation of a splenic lesion. Other common signs reported ranged from a painful reaction to palpation in the epigastric region and upper left abdominal quadrant, with a reduction or disappearance of epigastric tympany, to diffuse peritoneal signs as well as hemodynamic changes such as pallor, hypotension, tachycardia, dyspnea, and even shock. The time of onset of the symptoms of the splenic trauma varied from two hours to as much as 10 days after the colonoscopy. There is also one report of a patient whose painful symptoms caused by the splenic lesion developed 13 days after the test was performed.

The following were identified as possible splenic trauma risk factors during colonoscopy: coagulopathies, infections, splenomegaly of hematological origin, certain pharmacological treatments (e.g. erythropoietic growth factors), intestinal or pancreatic inflammatory processes, and a history of intra-abdominal surgery, but the literature fails to establish the concusal role for such risk factors in the occurrence of splenic lesions.

In the case described here, while the onset of symptoms of splenic injury (hypotension and progressive anemia) and the radiological findings of hemoperitoneum after the colonoscopy confirm the causal relationship between the invasive procedure and the rupture of the splenic capsule, it is impossible to accuse the colonoscopist of any evident negligence, which would have been readily recognizable, for instance, had there been an associated perforating injury to the intestinal wall during the surgical phase of the test.

In our case, there is nothing to indicate that the colonoscopist’s behavior was culpable, and that the operator could consequently be accused of manifest inexperience, negligence or imprudence. The fact (emerging from our review of the international literature) that there are no specific risk factors to predict splenic vulnerability before or during a colonoscopy suffices to make this type of lesion unpredictable and practically impossible to contrast. Analyzing the reported cases enables “generic” risk factors to be identified (particularly antiagulant prophylaxis and adhesions from prior surgery, both of which applied to our case), but these factors do not demand a different patient management for colonoscopy.

Nor can we hypothesize a diagnostic delay because, as the literature shows, the rarity of this particular complication and the mild associated symptoms sometimes mean that the injury is diagnosed only after several days, as in the case presented here. Given the difficulty of presenting inconclusive defensive arguments in court, the hospital’s insurance company opted to negotiate a settlement for a much lower figure than was originally requested to avoid the hazards of judgment — relating more to legal procedural issues than to any technical considerations. In the Italian civil lawsuit, there is a growing focus on the contractual nature of the professional relationship between patients and hospitals that puts dural issues than to any technical considerations. In the Italian civil lawsuit, there is a growing focus on the contractual nature of the professional relationship between patients and hospitals that puts professional service they provide.

This is naturally all the more difficult to do when it comes to rare or exceptional complications, when the anatomic or pathological factor that triggered the injury cannot be clearly identified. In other words, the emphasis is on the principle of liability for a patient's...
baseline condition worsening after a surgical (or medical) procedure with a high binding force, which would normally be expected to have a positive outcome and no negative sequelae for the patient's state of health. This approach to the issue of medical professional liability brings the Italian civil law system close to that of common law, and this is clearly expressed in the following ruling of the Supreme Court (Cass. Civ.) sentence n. 6141/78, which is now dated but has nonetheless been recalled in recent sentences: “In the case of procedures that are easy to perform, there is no passage from obligation of action to obligation of results, which would be difficult to justify dogmatically without denying the same distinction between two types of obligation (as the majority of recent doctrine does), but the principle of res ipa loquitur applies, as is amply applied on the matter in British and American law (where medical responsibility is always of an aquinarian nature), in the sense of that circumsidential evidence that leads to a deduction of negligence”.

Our case could justifiably fit this definition, and that is why it was advisable to go for a settlement. In medico-legale series relating to cases of iatrogenic lesions, the Italian system seems to be increasingly oriented towards finding solutions negotiated out of court wherever possible. A recent legislative reform identified the matter of medical professional responsibility as worthy of a formal mentioning the Law n. 69/2009).

Conflict of interest
None declared.

Funding
None declared.

Ethical approval
None declared.

References