Estudo de Caso

PERFORATED ACUTE APPENDICITIS AFTER COLONOSCOPY -
A CASE REPORT AND LITERATURE REVIEW

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Abstract

Introduction: Colonoscopy is a widely used fairly safe procedure. Acute appendicitis is a rare complication of colonoscopy, with perforated acute appendicitis being even rarer. A case of acute gangrenous appendicitis with perforation, following a colonoscopy is presented in this study. A systematic literature review is presented.

Case report: A case report of a 56-year-old diabetic and hypertensive female with an abdominal pain 12 hours after colonoscopy is presented.

She was admitted at the emergency department, after having had pain for 72 hours. She had a generalized abdominal pain. Due to suspicious colon perforation an exploratory laparotomy was done and the diagnosis of perforated acute appendicitis confirmed.

Discussion: The physiopathology of acute appendicitis after colonoscopy is not clear. In this case it could be a result of stool accumulation in the appendix due to air insufflation.

There are only 23 case reports described in the literature, with a male predominance and the first symptoms occurring within the first 12 hours after colonoscopy in the majority of the cases.

Conclusion: Acute perforated appendicitis after colonoscopy is rare and it should be excluded when a right quadrant abdominal pain is present.

Keywords: acute appendicitis, perforation, perforated appendicitis, colonoscopy

Resumo

Introdução: A colonoscopia é um procedimento amplamente utilizado e seguro. A apendicite aguda é uma complicação rara da colonoscopia, sendo a apendicite aguda perfurada ainda mais rara. Neste estudo, apresentamos um caso de apendicite aguda gangrenosa com perfuração, após colonoscopia. É realizada uma revisão sistemática sobre os casos de apendicite aguda perfurada.

Caso Clínico: É apresentado o caso clínico de uma mulher diabética e hipertensiva de 56 anos com dor abdominal com início 12 horas após a realização de colonoscopia.
Esta recorreu ao serviço de urgência com dor abdominal com 72 horas de evolução. À entrada no serviço de urgência apresentava dor abdominal generalizada. Devido à suspeita de perfuração cólica foi realizada uma laparotomia exploradora e constatou-se a presença de apendicite aguda perfurada.

**Discussão:** A fisiopatologia da apendicite aguda após colonoscopia não é clara. Neste caso, poderia ser o resultado da impactação de fezes no apêndice devido à insuflação de ar. Existem apenas 23 casos descritos na literatura, com predomínio do sexo masculino, em que os primeiros sintomas se iniciam na maioria dos casos nas primeiras 12 horas após a colonoscopia.

**Conclusão:** A apendicite aguda perfurada após colonoscopia é rara e deve ser excluída sempre que estiver presente dor abdominal nos quadrantes direitos.

**Palavras-chave:** apendicite aguda, perfuração, apendicite perfurada, colonoscopia

**Introduction**

Colonoscopy is a widely used screening, diagnosis and treatment procedure, with low risk of complications (0.2-3 %) [18, 22]. The most common complications are perforation, bleeding, diverticulitis and postpoliectomy syndrome [22, 15]. A rare complication of colonoscopy is acute appendicitis, with perforated acute appendicitis being even rarer with only a few cases described in the literature.

The reason why colonoscopy may lead to appendicitis is not clearly understood [18]. An uncommon case of acute gangrenous appendicitis with perforation, following a colonoscopy is presented in this study. A systematic literature review is elaborated.

**Case Report:**

A 56-year-old diabetic and hypertensive female with dyslipidaemia was subjected to a screening colonoscopy and was asymptomatic before the procedure. The patient had a good mechanical bowel preparation. However, the endoscope was only introduced up to the hepatic flexure of the colon, due to a colon angulation which impaired endoscope progression. A sigmoid polyp was identified and a polypectomy was done without any immediate complications.

She started with mild generalized abdominal pain 12 hours after the procedure, which gradually intensified. She was admitted to the emergency department, after having generalized abdominal pain for 72 hours.

On examination, she was febrile (temperature=38.4ºC), her blood pressure was 137/61 mmHg with a heart rate of 88 beats per minute. Her abdomen showed tenderness with peritoneal sign.

Laboratory tests revealed a hemoglobin of 10,5g/dl, white blood cells of 9x 10^3/µl with neutrophilia of 88.8% and C-reactive protein level of 31,7mg/dl.
An upright abdominal X-ray demonstrated a colonic distension. A subsequent abdominal and pelvic computerized tomography was done, which revealed a colonic distension and small amount of free gas between the transverse colon and the liver. Having a suspicion of a colon perforation, an emergency laparotomy was done. Intraoperatively there was no evidence of colon perforation and a perforated acute gangrenous appendicitis with localized peritonitis was identified. She was subjected to an appendicectomy and the abdominal cavity was washed and drained. The postoperative course was uneventful. The discharge was on the 5th postoperative day when she completed 5 days of endovenous antibiotics (amoxicilone+clavulanic acid and metronidazole) with the switch to oral for a further 3 days. Histological specimens confirmed the clinical diagnosis of gangrenous acute appendicitis with a fecolith.

Discussion:
The definition of acute appendicitis after colonoscopy is an inflammatory process of the appendix which occurs within the first 72 hours after colonoscopy [18]. The physiopathology of acute appendicitis after colonoscopy is not clear, however, some mechanisms can explain this occurrence [18]. Possible explanations may be: the barotrauma from over insufflation [15, 2, 6, 20]; stool accumulation in the appendix due to air insufflation, which may lead to obstruction and/or inflammation [6, 14, 5]; direct trauma by endoscope progression into the appendix lumen [6, 20]; exacerbation or pre-clinical disease [4]; carbon dioxide insufflation and dilatation of the appendix [3] and inflammation due to glutaraldehyde-type solution, used for cleaning endoscopes [20, 13, 10].
The diagnosis may be challenging due to a similar clinical presentation of colon perforation. Late diagnosis can lead to peritonitis and death [18].
In this study, acute appendicitis could be a result of stool accumulation in the appendix due to air insufflation, which may lead to obstruction and/or inflammation. In this particular case report the explanation of direct trauma was excluded, since the colonoscopy did not visualize the right side of the colon.

The hypothesis of a pre-existing initial acute appendicitis is unlikely as the patient was asymptomatic before the procedure.

The precise diagnosis can be challenging and the delay in diagnosis can lead to perforated acute appendicitis. In addition, clinical symptoms may mimic other severe complications such as colon perforation.

It is essential to think of acute appendicitis after colonoscopy, when pain is present, particularly in the right quadrants of abdomen.

A literature review of perforated acute appendicitis is presented in this study.

An electronic literature search was done on MEDLINE. There were no limitations due to language or date of publication. A total of 23 case reports (including ours) were identified in the literature as perforated acute appendicitis after colonoscopy.

The basic characteristics of these cases, including our study, are presented in Table 1.

Based on cases reported in the literature, perforated appendicitis after colonoscopy seems to be much more common in males (65%). The range of age of patients with this complication varied between 47 and 79.

The first symptoms occurred within the first 12 hours after colonoscopy in the majority of the cases, with diagnosis confirmation after 24 hours from the beginning of the pain in 6 cases.

Table 1: Case reports of postcolonoscopy perforated appendicitis

<table>
<thead>
<tr>
<th>First author</th>
<th>Year</th>
<th>Sex</th>
<th>Age</th>
<th>Time after colonoscopy (onset)</th>
<th>Diagnosis (time after colonoscopy)</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segawa(^1)(^7)</td>
<td>1992</td>
<td>M</td>
<td>49</td>
<td>NS</td>
<td>4 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Vender(^2)(^0)</td>
<td>1995</td>
<td>F</td>
<td>57</td>
<td>Immediate</td>
<td>Immediate</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Vender(^2)(^0)</td>
<td>2012</td>
<td>M</td>
<td>54</td>
<td>4 hours</td>
<td>&lt;52 hours</td>
<td>NS</td>
</tr>
<tr>
<td>le Leusse(^1)(^1)</td>
<td>1999</td>
<td>M</td>
<td>71</td>
<td>12 hours</td>
<td>1 day</td>
<td>Antibiotics, appendicectomy</td>
</tr>
<tr>
<td>Doohenl(^4)</td>
<td>2002</td>
<td>M</td>
<td>71</td>
<td>&lt;12 hours</td>
<td>24 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Kapral(^9)</td>
<td>2003</td>
<td>M</td>
<td>79</td>
<td>Same day</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Kapral(^9)</td>
<td>2003</td>
<td>M</td>
<td>79</td>
<td>Same day</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Izzedine(^7)</td>
<td>2005</td>
<td>M</td>
<td>61</td>
<td>24 hours</td>
<td>24 hours</td>
<td>Antibiotics, appendicectomy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Gender</th>
<th>Age</th>
<th>Presenting Time</th>
<th>Duration</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnston</td>
<td>2008</td>
<td>M</td>
<td>55</td>
<td>5 hours</td>
<td>16 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Sheikh</td>
<td>2010</td>
<td>F</td>
<td>50</td>
<td>NS</td>
<td>4 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Moorman</td>
<td>2010</td>
<td>F</td>
<td>71</td>
<td>NS</td>
<td>12 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Moorman</td>
<td>2010</td>
<td>M</td>
<td>47</td>
<td>NS</td>
<td>27 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Rodriguez-Otero</td>
<td>2011</td>
<td>F</td>
<td>50</td>
<td>6 hours</td>
<td>6 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Loureiro</td>
<td>2011</td>
<td>M</td>
<td>54</td>
<td>4 hours</td>
<td>36 hours</td>
<td>Laparoscopic appendicectomy</td>
</tr>
<tr>
<td>Musielak</td>
<td>2012</td>
<td>F</td>
<td>45</td>
<td>4 hours</td>
<td>&lt;12 hours</td>
<td>Laparoscopic appendicectomy</td>
</tr>
<tr>
<td>Srivastaval</td>
<td>2012</td>
<td>M</td>
<td>47</td>
<td>27 hours</td>
<td>92 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Srivastaval</td>
<td>2012</td>
<td>M</td>
<td>55</td>
<td>5 hours</td>
<td>&lt;24 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Srivastaval</td>
<td>2012</td>
<td>F</td>
<td>71</td>
<td>24 hours</td>
<td>&lt;33 hours</td>
<td>NS</td>
</tr>
<tr>
<td>April</td>
<td>2012</td>
<td>M</td>
<td>71</td>
<td>0-12 hours</td>
<td>24 hours</td>
<td>NS</td>
</tr>
<tr>
<td>Wong</td>
<td>2014</td>
<td>M</td>
<td>47</td>
<td>13 hours</td>
<td>NS</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Parnmythiotis</td>
<td>2016</td>
<td>F</td>
<td>60</td>
<td>10 hours</td>
<td>24 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Zhou</td>
<td>2017</td>
<td>M</td>
<td>73</td>
<td>72 hours</td>
<td>NS</td>
<td>Laparotomy, appendicectomy</td>
</tr>
<tr>
<td>Rodrigues</td>
<td>2018</td>
<td>F</td>
<td>56</td>
<td>12 hours</td>
<td>72 hours</td>
<td>Laparotomy, appendicectomy</td>
</tr>
</tbody>
</table>

M/F: Male/Female; NS: Not specified

Conclusion:
Acute perforated appendicitis after colonoscopy is rare.
The diagnosis may be challenging. The clinical presentation may be confused with other complications after colonoscopy such as colon perforation. The late diagnosis can lead to peritonitis and death. It is essential to exclude acute appendicitis when a patient presents right quadrant abdominal pain after colonoscopy.

References:
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