

Review

Surgery for Symptomatic Colon Lipoma: A Systematic Review of the Literature

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Abstract. *Aim: Isolated colon lipomas are rare benign tumors. We herein conducted a systematic review of the literature to identify clinical characteristic, diagnostic and treatment options. Materials and Methods: A search for relevant studies was conducted in Scopus, Embase and Medline databases until the end of May 2014. The search terms were “colonic lipoma and colon lipoma”. Articles were included if they had information on symptoms, lipoma characteristics and type of procedure performed. Results: 88 articles describing 184 patients affected with colonic lipomas were found. One hundred and twenty-seven patients were selected for further analysis. The most common signs included abdominal pain, rectal bleeding and alteration in bowel habits. Colonic lipomas were frequently localized in the right colon (50%). The majority of patients had open surgery, whereas current treatment is laparoscopic resection. Conclusions: Laparoscopic surgery is the current standard-of-treatment of symptomatic colonic lipomas greater than 2 cm in diameter or when malignancy can not be preoperatively excluded.*

Colon lipomas are non-epithelial benign tumors originating from the adipose tissue (1). The lesion is mostly isolated but segmental or diffuse lipomatosis has been also reported (2-4). Autoptic studies demonstrated that the prevalence of this lesion is between 0.2 and 4.4% in the general population and represents 1.8% of all colonic benign lesions (5). These tumors are most common in the fifth and sixth decades of life (6). Females seem to be more commonly affected and the most common localization is the right colon (1).

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Colonic lipomas arise from the submucosa in approximately 90% of cases but occasionally extend into the muscularis propria; however, up to 10% are subserosal (7, 8).

The etiology of colonic lipomas is unknown. Several theories have been proposed but none of them seem to be satisfactory. Chronic irritation and inflammation have been held responsible for forming colonic lipomas. Some authors suggested that fatty tissue accumulates in a certain area due to under-development of the arterial, venous and lymphatic circulation (1, 5-8).

Colonic lipomas are incidentally discovered during colonoscopy, surgery or autopsy. However, lipomas exceeding 2 cm in diameter often determine symptoms (6). Clinical presentation varies from non-specific abdominal symptoms to life-threatening hemorrhage, intussusception and intestinal obstruction (1, 5, 6).

The aim of the present review, to which we added our case, is to identify and discuss the clinical characteristics, diagnostic and treatment options of this disease.

Materials and Methods

Literature search. The literature search included Scopus, Embase and Medline up to the end of May 2014. Hand searching of reference lists of relevant studies and previous review articles was also performed. No language restrictions were applied. The search term was “colonic lipoma and colon lipoma”. Articles were included if they had enough information regarding symptoms, lipoma characteristics (size, location) and type of procedure performed. In the case of duplicate publications, the latest and most complete study was included. Articles dealing with multiple lipomatosis were excluded.

Data extraction. Two independent reviewers (DC and GP) extracted data from each study using a predefined database form, which resulted in high inter-observer agreement. The information included the names of the authors, title of the study, journal in which the study was published, country and year of the study, treatment regimen, method by which surgery was performed, symptoms of the patients and also geometrical and pathologic characteristics of the

lesions. After completing the data extraction from the included papers, the two independent reviewers discussed the results of the collected data and, if discrepancies were present, a consensus was reached by mutual agreement on the accuracy of the data.

Statistical analysis. Data were entered into a computer spreadsheet and statistically analyzed with the SPSS 21 software for Mac OSX 10.9.3 (Apple Inc. 1983-2014 Cupertino, CA 95014, USA). Data were expressed as mean±standard deviation (SD). The comparisons of the groups were tested with the Pearson χ^2 test, using Yates correction or the Fischer's exact test when appropriate for categorical variables, and with the Student's *t*-test for continuous variables. The correlation between tumor size (cut-off at 2, 3 and 4 cm) and symptoms at presentation was calculated with the Spearman method. The *r* value is reported for all linear regressions. A *p*-value of <0.05 was considered statistically significant.

Results

Our search identified 88 articles in total (1, 5-91) describing the clinical course of 184 patients with symptomatic large lipomas. From the review, we excluded 19 papers (73-91) describing 58 patients because of incomplete information in 12 or because we were not able to find the complete article in 7. The remaining 70 papers reached the inclusion criteria.

One hundred and twenty-six patients were retrieved to which we added our one case making a total of 127 patients available for analysis.

Demographics. There was a slight female predominance (55%). Mean age at presentation was 61±9 (range=31-82) years.

No specific information regarding weight, body mass index and biochemical tests were available. No familial predisposition to develop colonic lipomas was reported. No patients had associated subcutaneous lipomas.

Patients' clinical presentation. Twenty-seven (21%) patients were asymptomatic, whereas 100 (79%) were symptomatic. Symptoms at presentation consisted of abdominal pain in 51 (51%) cases, rectal bleeding in 46 (46%), alteration in bowel habits in 29 (29%), colocolic intussusception in 25 (25%), weight loss in 5 (5%) and volvulus of the sigmoid colon in 1 (1%). In 1 (1%) case a spontaneous expulsion was noted.

Diagnostic tools. Barium enema, computed tomography (CT) scan and colonoscopy were the diagnostic tools used alone or in association to investigate the presence of colonic lipomas. Twenty-seven (21%) patients had a barium enema, which showed the presence of a filling defect in 26 (96%) cases or exhibited a lobulated appearance in 9 (37%) cases. In 17 (63%) cases an ovoid, well-demarcated radiolucent mass was seen. Overall, these findings were not specific to differentiate the colonic lipoma from a malignant tumor.

Preoperative CT scan was performed in 52 (41%) patients. A spherical or ovoid mass with absorption densities of 40 to 120 Hounsfield units, typical of fat, was observed in 22 (42%) patients and permitted to correctly identified colon lipomas (Figure 1).

Magnetic resonance imaging (MRI) was used in 4 (3%) cases. Fatty composition of the tumor was noted in 4 (100%) cases, thus permitting a correct identification of the tumor.

Diagnostic colonoscopy was used in 55 (43%) patients. A rise of mucosa by the biopsy forceps was seen in 114 (100%) patients. In 33 (29%) patients an atypical (2 cases), callous (3 cases) or ulcerated shape (28 cases) was observed. Overall, diagnostic colonoscopy was able to correctly identify the lipoma in 24 (44%) patients.

Tumor characteristics. Mean size of the lipomas was 4±2 cm (range=2-11 cm). The preferential localization of colonic lipomas was the right colon (63 patients, 50%). Nineteen (15%) patients had the tumor localized in the transverse colon, 30 (23%) in the sigmoid colon and 15 (12%) in the descending colon. A significant correlation between symptoms and tumor size was observed (*p*<0.03, *r*=0.76). Lipomas greater than 4 cm in diameter were always symptomatic (*p*<0.001). Five (5%) patients affected with a tumor lower than 4 cm in diameter had abdominal pain.

Endoscopic procedure. Fifty-nine (46%) patients underwent endoscopic excision of the lipomas, which was complicated in 4 (8%). Endoscopic complication consisted of 3 perforations and 1 massive bleeding. In all cases an emergent surgery was required. Emergent surgery after complicated endoscopy did not jeopardize patients' survival nor complication rates.

Surgical procedure. Sixty-eight (53%) patients underwent elective surgery. Fifty-two (76%) patients had open surgery and 16 (23%) underwent laparoscopic resection. Overall, no mortality or major complications were recorded. No statistical differences in terms of morbidity and mortality between open and laparoscopic surgery were reported. A significant trend for the adoption of laparoscopy as the standard of treatment was noted starting from the past two decades (*p*<0.001). The length of stay after laparoscopic surgery was significantly shorter than after open surgery (5±3 days *versus* 7±3 days, *p*<0.001).

Follow-up. No data were available for long-term follow-up but at a mean follow-up of 12 months none of the patients had problems related to the operation or recurrence of the disease. No differences were noted between patients treated with open or laparoscopic surgery.



Figure 1. CT scan of a 50-year-old patient admitted at our Institution with a 4-week history of abdominal pain. The white arrow indicates an ovoid lesion (3 cm in diameter) at the level of the colonic splenic flexure with a suspicion of submucosae infiltration mimicking (white asterisk) a malignant tumor.

Discussion

At present several concerns exist regarding the best treatment of this benign tumor. Although the literature is plenty of case series or small and incomplete literature reviews, demographics, signs, symptoms, diagnostic tools and best treatment are poorly defined. We reviewed the international literature to which we add our case to propose a rationale approach to this rare disease.

We demonstrated that females were affected as male and no gender prevalence was observed. The tumor affects the sixth decade of life. The disease is not associated with other lipoma localization.

Symptoms were always present for lipomas larger than 4 cm. Symptoms varied from abdominal pain, alteration in bowel habits or more severe, such as life-threatening rectal bleeding, colocolic intussusception, intestinal obstruction or colon volvulus.

We demonstrated a significant correlation between symptoms and tumor size. The greater was the size of the tumor, the more severe were the symptoms at presentation. Few patients had symptoms in the presence of small size (lower than 4 cm tumors).

Preoperative diagnosis is important for planning the correct treatment; however, due to the variability in presentation and appearance, discrimination from malignant lesions is difficult and at present the preoperative diagnose of a colonic lipoma may be challenging. Our revision demonstrated that there are three tools to theoretically diagnose colonic lipomas. Barium enema is a not reliable because the differentiation from a colonic malignancy is extremely difficult.

Theoretically, CT scan and MRI are useful in showing fatty composition of the tumor but the diagnosis is sometimes not definitive because local infiltration can be difficult to exclude.

The presence of necrotic mucosa, ulceration and relatively hard texture of the lesion make difficult the differentiation from a malignant lesion at colonoscopy. Furthermore, in the presence of active bleeding, biopsies may jeopardize the life of the patient and sometimes are useless because the sampled tissue may show undetermined results. Three endoscopic signs may help the diagnosis, including “tenting sign” (grasping the overlying mucosa), “cushion sign” (flattening and restoration of the shape of the lipoma) and the “naked fat sign” (extrusion of fat after biopsy of the colonic mucosa) (7).

Our review stated that, at present, colon lipoma is difficult to differentiate from a colon carcinoma; the risk of misdiagnosis is possible and the recommendation in case of doubt is still the removal of the tumor.

Therefore, the resection of symptomatic or greater than 2 cm in diameter colonic lipomas is mandatory but if the diameter is lower than 2 cm tumor removal should be reserved to cases of doubtful diagnosis. Endoscopic removal of colonic lipomas is recommended for lipomas smaller than 2 cm. If endoscopic removal is performed for lipomas greater than 2 cm a significant risk of complications, especially for sessile lesions, is reported.

Surgical resection seems to be the ideal treatment for symptomatic large lipomas, especially when malignancy cannot be excluded. Excision through a colonotomy or segmental colon resection permits a complete removal of the lipomas. A recent publication (7, 8) indicates that laparoscopic resection is a good alternative to open conventional surgery with all the known advantages of minimally-invasive procedures.

In conclusion, we believe that laparoscopic tumor removal is the standard-of-care in the present days for large and symptomatic colonic lipomas.

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