

Original Article

# Clinical Analysis on Endoscopic and Surgical Treatment Outcome of Colonic Lipomas: A 12-year Study in Southern Taiwan

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## Key Words

Colonic lipomas;  
Endoscopic treatment;  
Surgical resection;  
Treatment outcome

**Background.** Colonic lipomas are relatively uncommon tumors. We aimed to analyze the clinical outcome of colonic lipomas and discuss the controversial issues on surgery or endoscopic treatments.

**Methods.** Over 12 years period, six-teen confirmed diagnoses of colonic lipomas were enrolled. They were analyzed by dividing into surgical (n = 9) and endoscopic treated group (n = 7). Diagnosis of colonic lipoma was made based on pathological report.

**Results.** More symptomatic patients were observed in the surgical group ( $p = 0.001$ ). Patients in the endoscopic treated group had smaller size lipoma than the surgical group (median (interquartile range, IQR) size of 0.9 (0.6-3.5) cm vs. 3.3 (2.75-4.1) cm,  $p = 0.016$ ). Six patients received laparoscopic surgery and three of them by single-incision laparoscopic surgery. There were no immediate procedure-related morbidity and mortality in current study.

**Conclusions.** Treatment outcome of colonic lipomas are good for both surgical resection and endoscopic treatments with appropriate decisions. Generally, larger colon lipomas without stalk should be treated by surgical resection, especially the sessile or broadly-based ones, malignant appearance on endoscope examination, and in symptomatic patients like intussusception or severe bleeding.

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Colonic lipomas are relatively uncommon tumors which originate from the mesenchyma and are the second most common colon benign tumor after adenomatous polyps.<sup>1</sup> The components are well-differentiated adipose tissue supported by fibrous band which was mostly located at cecum and ascending colon.<sup>1,2</sup> Colonic lipoma is generally mildly sympto-

matic or asymptomatic and is usually an incidental finding at colonoscopy, surgery, or autopsy.<sup>3-5</sup> Larger lesions may produce symptoms, such as abdominal pain, rectal bleeding, bowel obstruction, intussusception and even weight loss.<sup>5-7</sup>

Even in the condition of presenting with dramatic characteristics in colonoscopy, barium enema and CT

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scan, colonic lipoma is still underemphasized and usually misdiagnosed.<sup>4,6,8-12</sup> In this retrospective study, we aimed to analyze the clinical outcome of colonic lipomas and discuss the controversial issues on surgery or endoscopic treatments.

## Patients and Methods

Over a period of 12 years (January 2000-December 2012), a total of 16 patients with a pathological diagnosis of colonic lipoma were included from the files of the department of Pathology, Kaohsiung Chang Gung Memorial Hospital, Taiwan. Patients with incomplete chart recordings were excluded. We looked for those patients with a final confirmation of colonic lipoma and performed this retrospective study to analyze the demographics and clinical manifestations, including age, sex, medical history, symptoms and signs, physical findings, endoscopic features and therapeutic outcomes by chart reviews. Diagnosis of colonic lipoma was made based on pathological report. They were divided into surgical and endoscopic group and further analyzed by using Mann-Whitney U test and Chi-square test.

## Results

This study recruited 16 patients (7 male patients and 9 female patients) with a pathological diagnosis of colonic lipoma in the last 12 years. Table 1 summarizes the demographics, clinical manifestations and treatment outcome of these 16 patients. The ages ranged from 40 to 78 years with a mean age of  $60.7 \pm 10.7$  years. Overall, the median (IQR) size of lipomas were 2.41 (0.6-4.1) cm. Table 2 compared the clinical variables between the surgical group and endoscopic group of patients with colonic lipomas. Statistic significant in variant of size and abdominal symptoms were observed between surgical/endoscopic groups. The significant variables between the two groups were abdominal symptoms (100% vs. 28.6%,  $p = 0.001$ ) and the size of the lipomas (3.3 cm, ranged from 2.75-4.1 cm vs. 0.9 cm, ranged from 0.7-3.5 cm,  $p = 0.016$ ).

The most common symptoms in current study cohort were abdominal pain ( $n = 6$ , 37.5%), bloody stool ( $n = 4$ , 25%), constipation ( $n = 3$ , 18.8%). One patient (case 2) suffered from abdominal pain caused by intussusceptions owing to one of her multiple intestinal lipomas. Two patients (case 7 and 8) were initially thought to be malignancy during colonoscopy examination. One of them suffered from abdominal pain and the other had bloody stool passage. Five patients were asymptomatic. All of them were small-sized lesions smaller than 1.2 cm and belonged to the endoscopic group.

Two-third of our patients had their colonic lipoma located in the descending colon ( $n = 10$ ), five (31.3%) in ascending colon and one (6.3%) in transverse colon. Almost all patients had at least one of the following endoscopic features of colonic lipomas such as tent sign with grasping the overlying mucosa (Fig. 1A), cushion sign with indentation of the lipoma with the biopsy forceps or naked fat sign with fat extrusion after removal or serial biopsy. In one female patient with colon cancer, an approximately 3.0 cm lipoma was found incidentally 11 cm apart from the cancer lesion (case 16). The lipoma was resected consequently with the cancer lesion by single-incision laparoscopic surgery successfully (Fig. 1B). Microscopic findings of this colonic lipoma revealed a well-defined nodule composed of mature adipose tissue in the submucosal area (Fig. 2A and 2B). The smooth muscle wall beneath the nodule is intact and the muscularis mucosa above the nodule is not involved by the lipoma. Two patients (case 7 and 8) were found to have colon polyps mimicking malignant polyps and eventually operated by the proctologists. In these two patients, the colonoscopy failed to pass through the obstructive lesion.

Seven patients (43.8%) were treated by endoscopic interventions such as polypectomy (case 3, 4, 9, 11, 13, and 14) and endoscopic mucosal resection (EMR) (case 10) in the endoscopic group of patients. The median (IQR) size in this endoscopic treated group was 0.9 (0.7-3.5) cm. Among them, four of the lesions smaller than 1.0 cm received polypectomy. Two other patients who had bigger lipomas with stalks (2.8 cm in case 4 and 3.5 cm in case 9) also received endoscopic

**Table 1.** Patients' demographic characteristics of colonic lipomas

Patient	Age/ Sex	Location	Underlying disease	Clinical manifestations	Size (cm)	Therapy	Outcome
1	60/F	Sigmoid	-	1	2.5	Surgical resection	Successful removal
2	40/F	Ileum	DM	1, 2	3.5, multiple	Surgical resection	Successful removal
3	60/F	Sigmoid	Uterus myoma s/p abdominal total hysterectomy	6	0.6	Polypectomy	Successful removal
4	58/F	Sigmoid	-	5	2.8	Polypectomy	Successful removal
5	61/M	Sigmoid	-	1	3.3	Surgical resection	Successful removal
6	67/M	Ileocecum valve	HTN, appendectomy	1, 3	2.2	Surgical resection	Successful removal
7	63/F	Transverse colon	-	1	3.5	Surgical resection	Successful removal
8	76/M	Descending colon	BPH, CVA	3, 5	4.1	Surgical resection	Successful removal
9	40/M	Cecum	Sigmoid polyp s/p	4	3.5	Polypectomy	Successful removal
10	71/M	Descending colon	HTN, stroke	6	1.2	EMR	Successful removal
11	70/M	Descending colon	BPH, stroke	6	0.9	Polypectomy	Successful removal
12	68/M	Sigmoid	CAD, BPH, DM	3, 5	3.4	Surgical resection	Successful removal
13	70/F	Sigmoid	HTN	6	0.7	Polypectomy	Successful removal
14	45F	Sigmoid	-	6	0.7	Polypectomy	Successful removal
15	63/F	Ascending colon	Syphilis	1	3.0	Surgical resection	Successful removal
16	59/F	Ascending colon	DM, HTN, colon cancer	5	3.0	Surgical resection	Successful removal

Abbreviation: DM: diabetes mellitus; s/p: status post; HTN: hypertension; BPH: benign prostate hypertrophy; CVA: cerebrovascular disease; EMR: Endoscopic mucosectomy resection; CAD: coronary artery disease.

Clinical manifestation: 1. abdominal pain; 2. Intussusception; 3. body weight loss; 4. Constipation; 5. Diarrhea; 6. bloody stool; 7. tenesmus.

**Table 2.** Comparison between Endoscopic treated and Surgical treated Patients

	Surgical group (N = 9)	Endoscopic group (N = 7)	<i>p</i> -value
Sex			1.000
Male	4 (44.4%)	3 (42.9%)	
Age (years-old)	61.9 ± 9.7	59.1 ± 12.5	0.791
Symptoms			0.001
Abdominal pain	6 (66.7%)	0 (0%)	0.006*
Bloody stool or diarrhea	3 (33.3%)	2 (28.6%)	
Asymptomatic	0 (0%)	5 (71.4%)	
Size (cm)	3.3 (2.75-4.1)	0.9 (0.6-3.5)	0.016
Location			0.145
Left side colon	4 (44.4%)	6 (85.7%)	
Right side colon	5 (55.6%)	1 (14.3%)	

Descriptive were expressed by mean ± SD, median (IQR), or sample size (percentage).

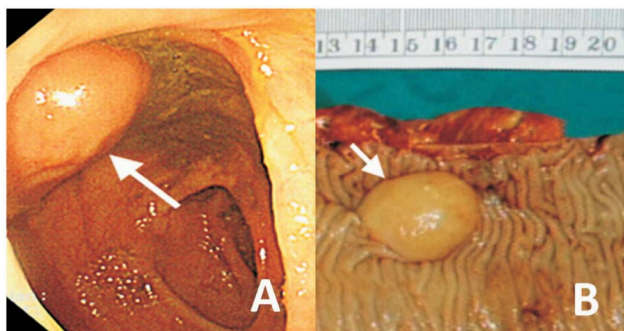
Abbreviation: SD. Standard deviation, IQR. Interquartile range.

Mann-Whitney U Test: Age and size.

Chi-square test: Sex, symptom, location.

Location: Left side: Descending colon, sigmoid colon, rectum; Right side: Ascending colon, cecum, ileocecum valve, ileum.

\* Statistic significant in variant of abdominal pain and asymptomatic between surgical/endoscopic groups.



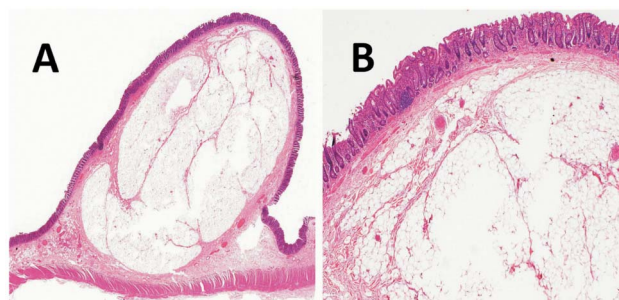
**Fig. 1.** Features of a colonic lipoma on colonoscopy examination (A) and gross appearance after single-incision laparoscopic surgical resection (B).

polypectomy. EMR was performed in a 1.2 cm colonic lipoma (case 10). There were 9 patients in the surgical group (56.3%). Seven of them were operated by laparoscopic techniques (3 by singer-incision laparoscopic surgery). The median (IQR) size of these 9 lesions was 3.3 (2.75-4.1) cm which was significantly bigger than those in the in the endoscopic treated group ( $p = 0.016$  by using Mann-Whitney U test) (Table 2). All of the 16 colonic lipomas were successfully removed with no immediate or long term procedure-related complication in current study.

## Discussion

Gastrointestinal lipomas occur from the hypopharynx to the rectum of GI tract, with the highest incidence in the colon.<sup>8</sup> The incidence of colonic lipoma in autopsy series ranges from 0.035 to 4.4%.<sup>6</sup> Most of the reported lipomas were located mainly at the right sided colon in contrast to current study cohort with two-third of our patients had their colonic lipomas located in the descending colon (62.4%), five (31.3%) in ascending colon and one (6.3%) in transverse colon.

The majority of colonic lipomas are asymptomatic, but sometimes larger lipomas (> 2 cm) may present with non-specific symptoms such as abdominal pain, constipation, diarrhea, palpable mass, weight loss, obstruction, bleeding and anemia.<sup>11</sup> In current study, all of the 9 patients in the surgical group were symptomatic but five in the endoscopic group were asymptom-



**Fig. 2.** Microscopic findings of this colonic lipoma revealed a well-defined nodule composed of mature adipose tissue in the submucosal area. (A): H&E stained, original magnification, x 100; (B): H&E stained, original magnification, x 400.

atic. This can be caused by the smaller size of lesions in the latter. Intussusceptions occurred in one patient who had multiple colonic lipomas, which was caused by one of the lipomas measuring approximately 3.5 cm. Generally, intussusceptions may occurred in lipomas large than 2 cm, but the rate is only about 5%-7%.<sup>13</sup>

Typical endoscopic features of colonic lipomas were tent sign (grasping the overlying mucosa), cushion sign (indentation of the lipoma with the biopsy forceps) or naked fat sign (fat extrusion after removal or serial biopsy (5). In literatures, about 46% of colonic lipomas were discovered incidentally and 11% were operated due to malignant appearance by colonoscopic examinations.<sup>10</sup> In current study, two patients (case 7 and 8) received colonoscopy examinations and were found to have colon polyps with malignant appearances. They were eventually operated by proctologists and found to be obstructed by big lipomas which measured about 3.5 cm and 4.1 cm respectively. All of our patients belonged to the submucous type. Microscopic findings are usually well-defined nodules composed of mature adipose tissue in the submucosal area. The smooth muscle wall beneath the nodule is intact and the muscularis mucosa above the nodule is not involved by the lipoma. The other two rare types are submucous subserous and intermucosaserosal type.

The treatment of colonic lipomas including endoscopic or surgical resection, but it was still controversial to determine which method is the best option. Generally, because most of the lipomas are submu-

cosal origin, endoscopic resection was recommended only in pedunculated lesions and smaller size lesions, < 2 cm for instance.<sup>3,5,10,14-17</sup> The median size of colonic lipomas in current study from the endoscopic treatment group was significantly smaller than the surgical group ( $p = 0.016$ ). Among them, four of the 7 lipomas in current study removed by endoscopic polypectomies were smaller than 1 cm. The major complication of polypectomy for lipoma is colon perforation, especially for large colonic lipoma. Recent improvement of endoscopic resection techniques such as endoscopic mucosa resection (EMR) or endoscopic submucosal dissection (ESD) may overcome the complication of endoscopic resection for large colonic lipoma. The submucosal injection of saline solution with or without epinephrine may reduce the risk of perforation [3]. Generally, endoscopic ultrasound (EUS) was suggested to evaluate whether the stalk of lipoma contains serosal component. The size of lipoma stalk is more important than the size of lipoma itself when endoscopic resection is considered. Endoloop ligation is another choice for lipoma with big and long stalk arising from the muscularis propria.<sup>18</sup> In current study, two other patients who had bigger lipomas with stalks (2.8 cm in case 4 and 3.5 cm in case 9) also received endoscopic polypectomy successfully without complications.

On the other hand, surgical resections are usually the better choice for larger colonic lipomas. In elderly patients with co-morbid diseases, conventional open colon resection is considered a major undertaking with considerable morbidity. Nine patients (56.3%) who underwent surgery in current study were those with significantly bigger lipomas with a mean (IQR) size of 3.3 (2.75-3.5) cm. Tamura and colleagues suggested that colon lipomas larger than 2 cm should be resected surgically.<sup>14</sup> The development of laparoscopic colon resection had reduced the rate of surgery-associated complication.<sup>19</sup> Moreover, current progress by using single-incision laparoscopic surgery is as effective as conventional laparoscopic surgery, and is not associated with increased duration of surgery, blood loss or complications.<sup>20</sup> Six of our patients received laparoscopic colon resection with less post-operative pain and quicker recovery. Among them,

three received single-incision laparoscopic surgery. In our colorectal center, the proctologist modified the design of a previously described home-made single-incision access device using a commercially available wound protector and surgical glove to make it more suitable for single-incision laparoscopic colorectal surgery. All of the patients were cured after treatment without immediate or long term procedure-related complication in current study.

Although there were published case reports for successful endoscopic removal of colonic lipoma by EUS guiding, injection of epinephrine-saline mixed solution on base of lipoma, the resection may be hindered by the inefficient conductor for electronic current for fatty tissue. One should always be reminded for the high rate of complications such as perforation and severe bleeding large lipomas.<sup>3,16,18</sup> In conclusion, treatment outcome of colonic lipomas are good for both surgical resection and endoscopic removal by polypectomy EMR or ESD with appropriate treatment options. Generally, larger colonic lipomas (> 2 cm) without stalks should be treated by surgical resection, especially the sessile or broadly-based ones, malignant appearance on endoscope examination, and those with significant symptoms such as intussusception or bleeding.

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原 著

## 結腸脂肪瘤以內視鏡及手術處理的臨床分析； 南台灣 12 年研究

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**背景** 結腸脂肪瘤為一種相對少見的腫瘤，此次研究目的在分析使用內視鏡與手術方式治療結腸脂肪瘤之臨床結果分析。

**方法** 回顧 12 年間，共納入 16 例確診病例，可分為手術治療組 (9 例) 與內視鏡治療組 (7 例)，結腸脂肪瘤的診斷均基於病理組織確診。

**結果** 大多數有臨床症狀的病例均歸在手術治療組；內視鏡治療組的脂肪瘤大小較手術治療組為小；共有六位患者接受腹腔鏡手術，其中三位接受單一切口腹腔鏡手術，在目前的研究中並未發現有與手術相關之併發症或死亡病例。

**結論** 在適當的選擇下，不論手術或內視鏡治療結腸脂肪瘤均有不錯的結果，一般較大的無莖型脂肪瘤應該採用手術切除，特別是扁平病灶或底部較寬的病灶、內視鏡觀察下懷疑惡性腫瘤、或病患合併有臨床症狀例如腸套疊或嚴重出血。

**關鍵詞** 結腸脂肪瘤、內視鏡治療、手術治療、治療結果。