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EXTRAUTERINE ADENOMYOMA: A REVIEW OF THE LITERATURE**Authors:****Designation**

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Abstract

Adenomyosis is the presence of endometrial glands and stroma within the myometrium. The focal and localized form of adenomyosis is known as adenomyoma. It is rarely located outside the uterus which is termed as extrauterine adenomyoma. We describe three cases of extrauterine adenomyomas which were located in pararectal space, round ligament and ovary. These cases were treated by laparoscopic excision and diagnosis was confirmed by histopathological examination. A review of the literature identified 34 cases of extrauterine adenomyomas. The most common locations were pararectal space, ovary and broad ligament. Other pelvic locations

included the round ligament, paraovarian, parametrial and pelvic wall. Extrapelvic adenomyomas were located in the liver, upper abdomen, inguinal scar, appendix and small bowel mesentery. The abdominopelvic pain was the most common clinical presentation of extrauterine adenomyoma. Various imaging modalities were used to identify extrauterine masses, but a definitive diagnosis could not be made preoperatively in any of the cases. Although rare, a possible diagnosis of adenomyoma must be contemplated while dealing with extrauterine masses. Surgical excision is the mainstay of treatment. Since malignancy has been reported in extrauterine adenomyomas, this possibility must be kept in mind while offering treatment.

Keywords: Extrauterine adenomyoma, pararectal adenomyoma, ovarian adenomyoma, round ligament adenomyoma

Introduction

Adenomyosis is the presence of endometrial glands and stroma within the myometrium. Three different forms of adenomyosis have been identified such as focal, diffuse and cystic. The focal and localized form of adenomyosis is known as adenomyoma. Although a definite diagnosis can be established only with histopathology, with the advent of high resolution imaging techniques a provisional diagnosis can be made.

Transabdominal sonography (TAS) or transvaginal sonography (TVS) is commonly used as the initial imaging modality. TAS does not allow reliable diagnosis of adenomyosis or consistent differentiation from leiomyoma because of its limited spatial resolution. TVS is more accurate in diagnosing adenomyosis because of its better spatial resolution. Typical appearances of adenomyosis at TVS include poorly marginated hypoechoic and heterogeneous areas within the myometrium, myometrial

cysts, and a globular or enlarged uterus. Magnetic resonance imaging (MRI) is a highly accurate noninvasive modality for diagnosis of adenomyosis. Adenomyosis appears as either diffuse or focal thickening of the junctional zone forming an ill-defined area of low signal intensity. Moreover, MRI is useful in distinguishing adenomyosis from a leiomyoma in cases of enlarged uterus¹.

Adenomyomas are rarely located at extrauterine sites such as ovary, broad ligament, ovarian ligament, pararectal and extrapelvic locations such as liver and abdominal wall. We report three cases of extrauterine adenomyomas managed by laparoscopic excision with a review of the literature. The aim of this review is to provide an insight into clinical presentation, diagnosis and management of extrauterine adenomyoma as it is a rare clinical entity.

Case 1

A 39-year-old female presented with complaints of heavy menstrual bleeding and mid cycle pain since five years. She also had difficulty in initiating micturition since two months. She had undergone a laparoscopic right ovarian cystectomy for endometriosis two years back. She had two normal vaginal deliveries and four miscarriages. Clinical examination revealed an enlarged retroverted uterus corresponding to 14 weeks gravid uterus size. Ultrasonography had a 10.3x7.1cm hyperechoic mass posterior to the uterus, the right ovary had a 4.6x4.3cm cyst with fine internal echoes, and the left ovary had a 2x1.9cm cyst with fine internal echoes. Both ovaries were seen close to the uterus. Laparoscopy had a normal size uterus which was retroflexed due to dense adhesions with rectosigmoid. Both ovaries had 5cm endometriotic cysts and were densely adherent to the rectosigmoid. A 10cm retroperitoneal deeply embedded mass was identified in the right pararectal space which was adherent to the uterus. It was exposed partially after isolation of the right ureter. The pararectal mass was dissected from the pelvic sidewall and the rectum after delineating the rectum. The patient underwent total laparoscopic hysterectomy, excision of the pararectal mass, right oophorectomy and left ovarian cystectomy.

All the specimens were sent for histopathological analysis. On cut section, the pararectal mass showed white whorled appearance with cystic spaces. Microscopic examination revealed numerous islands of endometrial glands with endometrial stroma amidst whorls and fascicles of smooth muscle cells with no significant mitosis consistent with adenomyoma. Bilateral ovarian cyst wall specimens were consistent with endometriotic cyst. The uterus had multiple leiomyomas with focal adenomyosis and both fallopian tubes showed no significant pathology. The postoperative period was uneventful, and the patient was discharged 24 hours after surgery. The patient was asymptomatic after a one month follow up.

Case 2

A 45 years old female presented with a history of dull aching right lower quadrant pain on and off since six months. She had two normal vaginal deliveries and had undergone a subtotal hysterectomy during her second delivery for severe post partum haemorrhage 12 years back. She had also undergone Laparoscopic left ovarian endometriotic cystectomy 20 years back and laparoscopic right adnexectomy with left salpingectomy for endometriosis four years back. Ultrasonography revealed a cervical stump of 3.5 x 2.5cm, left ovary had a multiloculated cyst of 6.5x3.8cm with fine internal echoes and right adnexa revealed a hyperechoic lesion of 3.3x2.8cm. Laparoscopy showed a multiloculated cyst containing chocolate material in the left ovary which was densely adherent to the rectosigmoid. A left oophorectomy was performed after adhesiolysis and isolation of the left ureter. The remnant right round ligament stump showed a 3cm firm mass which was excised and sent for histopathological analysis.

On cut section, round ligament specimen showed white firm areas with foci of haemorrhage. Microscopic examination showed dilated endometrial glands with stroma amidst hypertrophied whorls and fascicles of smooth muscle cells. Histopathological analysis of left ovary was consistent with endometriosis. The postoperative period was uneventful, and the patient was discharged 24 hours after surgery. The patient was asymptomatic after a one month follow up.

Case 3

A 37 years old nulligravida with a history of subfertility came with complaints of intermenstrual spotting and dysmenorrhea of one-year duration. She also complained of constipation since one year. She had undergone laparoscopic myomectomy five years back. On clinical examination, the uterus was enlarged corresponding to 12 weeks gravid uterus size with restricted mobility. Ultrasonography revealed a fundal hyperechoic mass of size 3.7x 3.5 cm and another hyperechoic mass in the left posterolateral wall of 5.9x 4.2 cm size. The posterior uterine wall was thickened suggestive of adenomyosis. The left ovary contained a cyst of 2.6x 1.9 cm with fine internal echoes, the right ovary was normal, and both ovaries were located close to the uterus. Laparoscopy revealed an enlarged uterus to 10 cm size possibly due to adenomyotic changes. The uterus was retroflexed due to dense rectosigmoid adhesions to the posterior uterine surface and both adnexae. The pouch of Douglas was completely obliterated. A 6cm mass was seen deeply embedded in the left pararectal space. The mass was dissected from the pelvic side wall and rectum with difficulty after isolating the ureter and delineating the rectum with a probe (Figure 1A). A 3cm well-defined, solid and encapsulated mass was seen in the right ovary (Figure 1B). As the consent for oophorectomy was not taken, excision of the mass was done. The left ovarian chocolate cyst wall was enucleated.

All the specimens were sent for histopathological analysis. Cut section of the pararectal and ovarian mass revealed whorled white firm areas. Multiple representative microscopic sections were analysed, these showed islands of endometriotic glands with stroma amidst whorls of benign smooth muscles with uniform cigar-shaped nuclei and no significant mitosis suggesting a diagnosis of adenomyoma (Figure 1C, 1D). The ovarian cyst wall specimen was consistent with an endometriotic cyst. The postoperative period was uneventful, and the patient was discharged 48 hours after surgery. The patient was asymptomatic after a one month follow up. She conceived in the second cycle of Intrauterine Insemination (IUI) after surgery.

Materials and Methods

We conducted an electronic-based search using databases PubMed and Google Scholar. The following keywords and their combinations were used: “extrauterine adenomyoma”, “pelvic adenomyoma”, “extrapelvic adenomyoma” and “uterus-like mass”. ‘Uterus-like mass’ represents a type of adenomyoma with an organized arrangement of tissues characterized by a single central cavity lined by endometrium and surrounded by a thick wall of smooth muscle, resembling a normal uterus. Thus ‘uterus-like mass’ was also included in this review. The reference list of identified studies was searched manually for additional articles. The search was limited to studies in humans and those published in the English language. No limit or filter was used for the time period. A record of the following information was made manually such as patient’s age, clinical presentation, size and location of extrauterine adenomyoma, diagnosis, management and follow up. Non English articles, articles with incomplete information and unavailable full text were excluded from the review.

Results

Our search yielded 176 articles. Initially articles and abstracts of these articles were screened and reviewed. After reviewing the abstracts, 118 articles were excluded owing to duplication, non-English articles and citations unrelated to extrauterine adenomyomas and 58 articles (66 cases) of extrauterine adenomyoma were found. After further exclusion of articles with unavailable full text and articles with incomplete information about history, diagnosis and management, 30 publications (34 cases) of extrauterine adenomyoma were eligible for the review (Table no.1).

Comment

The first case of extrauterine adenomyoma was reported by Cozzutto et al. in 1981[2]. Extrauterine adenomyoma of both pelvic and extrapelvic locations have been described in the literature. Out of these 34 cases, 19 were pelvic, 8 were extrapelvic and 7 cases involved multiple sites (Table no. 2). The most

common locations of extrauterine adenomyoma were pararectal space [3-7], ovary [8-13] and broad ligament [1], 14-18]. Other pelvic locations include the round ligament [19], paraovarian [20], parametrial [20] and pelvic wall [21]. Our first case had a single extrauterine adenomyoma located in the right pararectal space. Six other cases with pararectal extrauterine adenomyoma have been described similar to our case [3-7]. Our second case presented with an extrauterine adenomyoma of right round ligament. Only one similar case with round ligament adenomyoma has been reported so far [19].

In our third case, two extrauterine adenomyomas were found. One was located in the right ovary and the other in the left pararectal space. Seven other cases involved multiple sites [1] [4] [6] [12] [22] like sigmoid colon, ovary, omentum and upper abdomen. Ki Yong et al [22] reported multiple adenomyomas in the caecum and descending colon which were diagnosed after colonoscopy. Carinelli et al [4] was the first to report 2 cases of multiple extrauterine adenomyoma. He described a case with pararectal and ovarian adenomyoma similar to our case.

Extrapelvic adenomyomas have been described in 8 cases which were located in the liver [23] [24] [25], upper abdomen [26] [27], inguinal scar [28], appendix [29] and small bowel mesentery [30].

Various theories have been proposed for explaining the extrauterine location of adenomyoma. Rosai et al [31] suggested the theory of defective mullerian duct fusion to explain the extrauterine location of adenomyoma. Partial or complete fusion defects of bilateral mullerian ducts may result in uterine duplication or atresia. A unicornuate uterus with a rudimentary horn may develop, and this rudimentary horn may detach and implant elsewhere, resulting in extrauterine adenomyoma. This theory explains cases of extrauterine adenomyoma accompanying congenital urogenital abnormalities like renal agenesis, double excretory system and anomalies of the genital tract [21] [31-33]. Batt et al [34] proposed the theory of mullerianosis which states that a heterotropic organoid structure of embryonic origin composed of mullerian cell rests may get incorporated into normal organs at the time of organogenesis and result in

this condition. They proposed three criteria such as absence of pelvic endometriosis, no communication of adenomyoma with endocervix, endometrium and endo-salpinx and absence of surgeries on reproductive organs. This theory provides an explanation for unusual extrapelvic locations of adenomyomas. The theory of mullerianosis cannot be applied to our cases due to the presence of endometriosis and previous surgeries. Cozzuto et al [2] proposed the theory of smooth muscle cell metaplasia. This theory suggested that an already existing focus of endometriosis undergoes metaplasia into smooth muscle, explaining the pathogenesis of adenomyoma [2]. Histopathological finding of predominant smooth muscle with scattered endometrial glands in our cases is not consistent with the theory of smooth muscle metaplasia.

Redman et al [3] proposed the theory of sub-coelomic mesenchymal metaplasia. Subcoelomic mesenchymal layer lies below the mesothelial surface of the peritoneum and envelops the uterus, ovaries and tubes. This layer contains multipotent cells which have the capacity to differentiate into the endometrial stroma, decidua and smooth muscles under hormonal stimulation. The histopathological findings in their case had predominant smooth muscle with foci of endometrium. Similar histopathological findings were observed in our case series, supporting the sub-coelomic mesenchymal metaplasia theory.

Abdominopelvic pain is the most common clinical presentation of extrauterine adenomyoma. Few patients had additional symptoms like abnormal bleeding [18] [19] and infertility [10] [21]. Six cases had a history of pelvic endometriosis [4] [21] [22] [24] [26] [28]. Seventeen cases had a history of gynaecological surgery [3-6] [12] [14] [16] [20-26] [28] [29] such as hysterectomy, myomectomy or ovarian cystectomy. Our first case presented with heavy menstrual bleeding, mid-cycle pain and a history of right ovarian endometriotic cystectomy. Our second case presented with right lower quadrant pain and history of hysterectomy, left ovarian cystectomy, right adnexectomy and left salpingectomy. The third case presented with subfertility, dysmenorrhea, intermenstrual spotting and a history of myomectomy.

Although no definitive predisposing factors have been listed, Redman et al [3] reported a case of extrauterine adenomyoma after hysterectomy and prolonged estrogen therapy supporting the estrogen responsiveness of these lesions. Bayar et al [10] reported a case of extrauterine adenomyoma after gonadotropin treatment for infertility. None of our patients had a history of any prolonged hormonal therapy.

The age of the patients in these cases ranged from 17-70 years, and the diameter of the lesions ranged from 0.8 -20 cm. Our first patient was 39 years old with a 10cm lesion whereas the second case presented at 45 years of age with a 3cm lesion and the third case presented at 37 years of age with lesions of 6cm and 3cm.

Diagnosis of extrauterine adenomyoma is a clinical challenge as none of the cases was diagnosed preoperatively. Imaging modalities used in these 34 cases were ultrasonography (USG), computerized tomography (CT) and magnetic resonance imaging (MRI). Intravenous pyelography (IVP) was done in few cases to exclude co-existing renal abnormalities. Ultrasonography was the most common imaging modality used. CT was used in 17 cases [3] [4] [6-8] [11] [12] [14] [18] [19] [22-29], MRI was used in 8 cases [1] [4] [5] [11] [12] [16] [28] [35] and IVP was used in 6 cases [3] [8] [9] [11] [13] [21]. Ultrasonography alone was used as an imaging modality in all three of our cases. There is a paucity of literature on the radiological appearance of extrauterine adenomyoma. A definitive diagnosis of extrauterine adenomyoma in all 34 cases was established only postoperatively after confirmation on histopathology similar to our cases.

On histopathology, adenomyoma shows endometrial glands, endometrial stroma with smooth muscle cells. Uterus-like masses are defined as extrauterine organoid masses that are characterized by a single central cavity lined by endometrium and surrounded by a thick wall of smooth muscle, resembling a normal uterus and most likely representing a particular form of extrauterine adenomyoma [23].

Microscopic appearance of extrauterine adenomyomas should be carefully analysed to confirm the diagnosis as they can be confused with endometriosis with smooth muscle component and leiomyomas with endometriosis. Smooth cell metaplasia is focal, unlike adenomyoma which shows dominant smooth muscle component and is more circumscribed both on gross and microscopic appearance. In leiomyoma with endometriosis, the endometriotic cyst is usually peripheral and separate from the smooth muscle component²³. The lesions in our cases had endometrial gland dispersed within smooth muscle component consistent with adenomyoma.

Surgical management was done in all 34 cases. None of the studies reported any major intraoperative or postoperative complications except for one study by Carinelli et al [4] where in one case, partial colectomy was done along with excision of adenomyomas due to adhesions with sigmoid colon and in the second case sigmoid perforation was detected seven days later, and partial colectomy with a colostomy was done. Our cases were managed by laparoscopic excision without any complications.

Few cases provided insight into follow up of these patients ranging from two months to 10 years and recurrence has also been reported. All our cases were recently operated and are asymptomatic after a one month follow up. Carinelli et al [4] reported the recurrence after surgical excision of a sigmoid nodule with partial resection of right paraovarian nodule and omentectomy for multiple site adenomyomas. One year later laparoscopy, revealed multiple nodules over the peritoneum, the intestine and the left fallopian tube. Excision of the nodules with left salpingectomy followed by GnRH agonist therapy was offered. After a ten year follow up, there was no relapse. Carvalho et al [12] reported recurrence after 15 months. The patient received goserelin followed by anastrozole for recurrence. Medical treatment was not given to any of our patients.

Although most of these cases were benign, a few cases were associated with malignancy. Torres et al [18] reported clear cell adenocarcinoma in a case of broad ligament adenomyoma. Ulm et al [19] reported focal endometrioid adenocarcinoma in extrauterine adenomyoma (round ligament) with concurrent stage 1 uterine endometrioid adenocarcinoma. Rahilly et al [13] reported a concurrent occurrence of ovarian adenomyoma with ovarian endometrioid carcinoma and uterine endometrial cancer. So, clinician should be aware of the malignancy potential while dealing with extrauterine masses. An endometrial biopsy may be performed to detect any coexisting uterine malignancy especially in cases with abnormal uterine bleeding.

Strengths and limitations

The strengths of this review include its comprehensive search strategy and methodological design. No other review summarizes information about common locations, clinical presentation, diagnosis, management and malignant transformation of extrauterine adenomyomas. The limitation of this review is that only 11 out of the 34 cases provide information on follow up. 12 cases have not provided details of surgical procedure performed. There is paucity of data on radiological appearance of this rare pathology.

Conclusion

Although rare, a possible diagnosis of adenomyoma must be contemplated while dealing with extrauterine masses. A preoperative diagnosis is difficult to establish, as confirmation can only be made after histopathological analysis. Surgical excision is the mainstay of treatment. Since malignancy has been reported in extrauterine adenomyomas, this possibility must be kept in mind while offering treatment.

Author's role

PPG was the surgeon. PPG conceived, designed and wrote the review. PPG and all the other authors contributed together in manuscript drafting and critical discussion.

Role of the funding source

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Ethics Committee Approval

Written informed consent was obtained from the patients for publication of the case report and accompanying images. The retrospective observational nature of the study did not necessitate the local institutional ethics committee approval.

Conflict of interest

The authors declare that they have no conflict of interest

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Figure/Table Caption List

Figure 1A- Laparoscopic view of pararectal adenomyoma- Third case

Figure 1B- Laparoscopic view of right ovarian adenomyoma- Third case

Histopathological view of ovarian adenomyoma- Figure 1C- Low power, Figure 1D - High Power - Third case

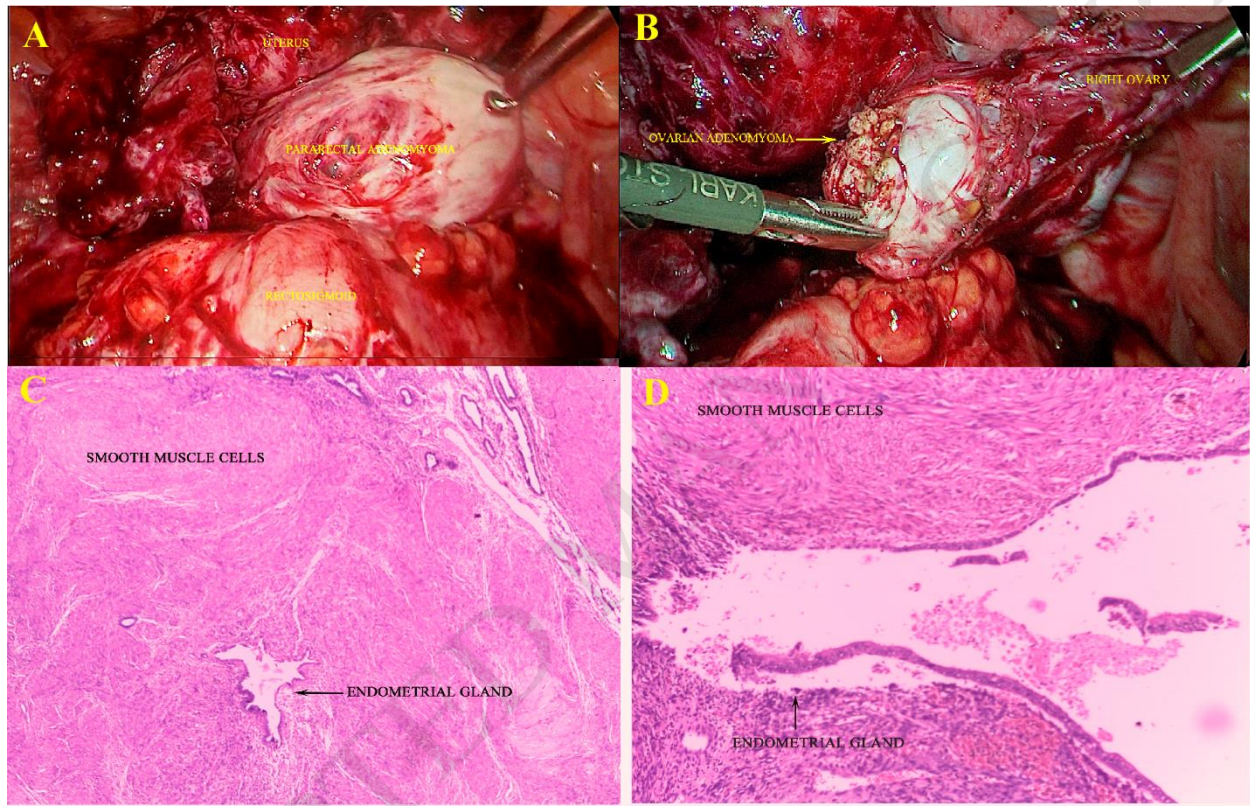


Table No.1- Flowchart of studies included in the review

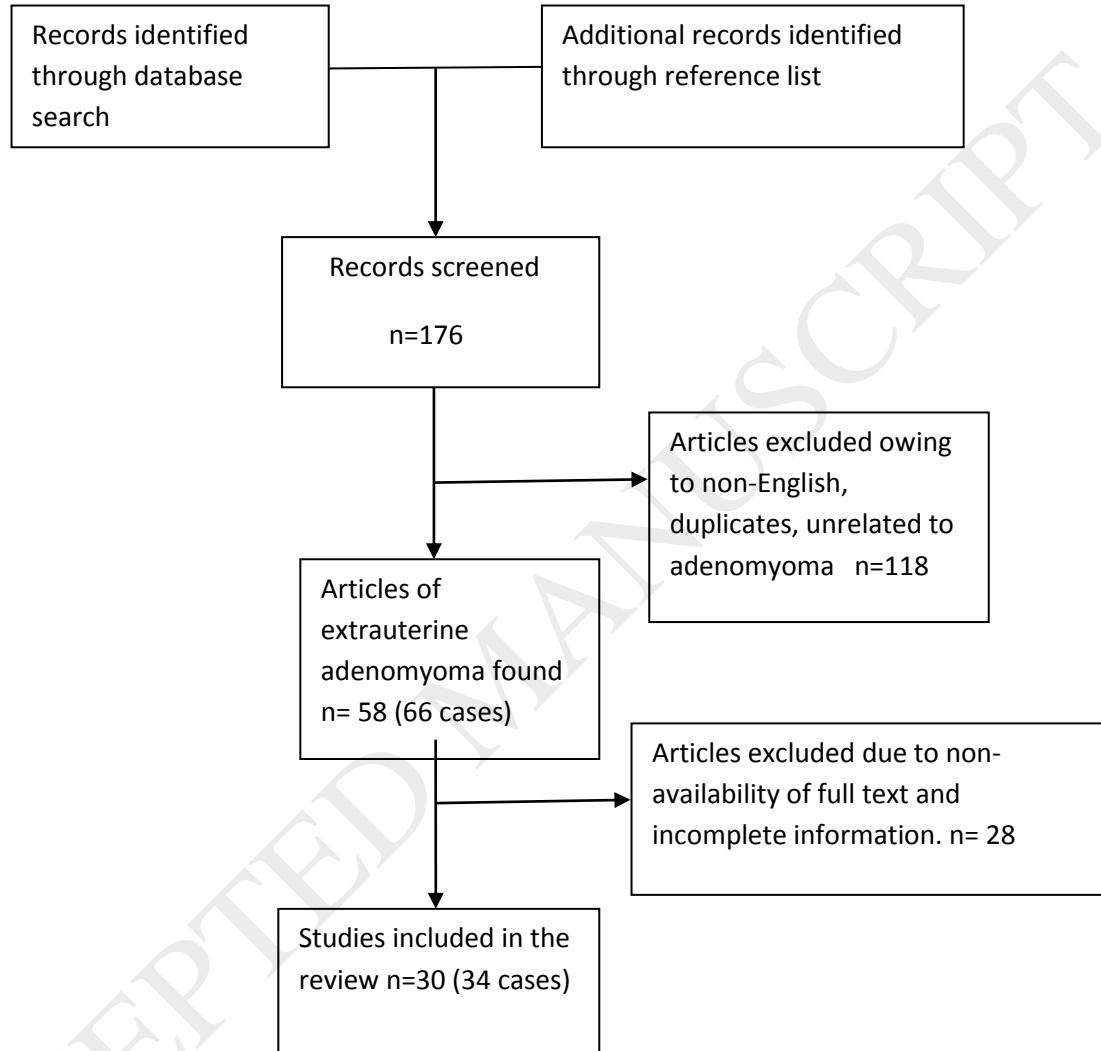
Table no.1

Table No. 2 - Description of extrauterine adenomyomas

Table no 2

Sr.no	Study (Year)	Size and location	Age	Past history	Presenting complaints	Imaging modalities	Surgical intervention
1	Rahilly et al (1991) ¹³	5cm, right ovary	38		RIF and pelvic Pain	IVP	TAH with BSO
2	Horie et al (1999) ³⁰	14x11cm, small bowel mesentery	59		Mass lower abdomen		Surgical excision
3	Redman et al (2005) ³	5cm, Pararectal	50	TAH with BSO + HRT	Dysuria and suprapubic, pelvic pain	CT, USG, IVP	Excision + left ureteric stenting
4	Bayar et al (2006) ¹⁰	7.5cm, left ovary	38	Gonadotropin treatment	Infertility and pelvic pain	USG	Laparoscopic excision
5	Choudhrie et al (2007) ⁸	0.8cm, Left ovarian ligament	57		Lump lower abdomen & pelvic pain	USG, IVU	TAH with BSO
6	Mi Jin Kim et al (2007) ⁷	10.5X9.5cm, pararectal	42		Lower abdominal pain	CT	Surgical excision
7	Menn et	6x4cm, right broad	37	Myomecto	Right quadrant	USG,	TAH

	al (2007) ¹⁶	ligament		my and polypecto my	pain and intermenstrual spotting	MRI	
8	Kaufma n et al (2008) ²¹ Case 1	7x5cm, right pelvic wall, absent right kidney, absent right ureter	39	Subfertility, PID	Dysmenorrhea, pain, menorrhagia,	USG, CT	Laparoscopic excision
9	Kaufma n et al (2008) ²¹ Case 2	10.5x 9cm, right pelvic wall	57	RSO, TAH + LSO for Endometri osis + HRT	RIF pain, suprapubic pain and backache	USG,CT ,IVP	Laparoscopic excision
10	Stewart et al (2008) ²⁰ Case 1	6x4.5cm left paraovarian mass	40	TAH for DUB	Left iliac fossa pain	USG	Laparoscopic excision
11	Stewart et al (2008) ²⁰ Case 2	6.3x4cm right parametrial mass	65	PID, breast cancer	Pelvic mass	USG	Hysterectomy with BSO with mass excision
12	Carinelli et al (2009) ⁴ Case 1	10cm sigmoid, 6cm pelvic, 4cm ileal, 1cm paraileal and paravesical	46	Myomecto my	Abdominal pain and constipation	USG,CT	Excision, Hysterectomy with partial colectomy and Meckel

							diverticulum resection + GnRH agonist
13	Carinelli et al (2009) ⁴ Case 2	3cm sigmoid, 3.5cm right ovary	39	Left ovariectomy for endometriosis	Dysmenorrhea, Chronic abdominopelvic pain	USG,CT, MRI	Laparoscopic excision. Partial colectomy with colostomy 7 days later + GnRH agonist for relapse
14	Liang et al (2010) ¹⁴	4cm, left broad ligament	17	Mesosalpinx cystectomy	Dysmenorrhea and pelvic pain	USG,CT	Excision
15	Sisodia et al (2011) ⁹	5.5x5.3cm, Right ovarian ligament	56		Dysuria, lower abdominal pain, bleeding per vaginum	USG,IVP	TAH with BSO
16	Moon et al (2011) ⁵	7x6cm, pararectal	41	SCH and right salpingectomy		USG, MRI	Excision and LSO
17	Seki et al(2011)	3.8 x 2cm, left inguinal region	44	Left oophorectomy	Abdominal pain	USG, MRI	Surgical excision

	28			omy, Endometri osis			
18	Takeda et al (2011) ¹¹	3.8x3.7cm, left ovarian ligament	39		Pain lower abdomen	CT, MRI,IVP	Laparoscopic excision
19	Moghad amfalahi et al (2012) ⁶	6cm pararectal, 7.5cm upper abdomen	39	SCH, Cervical myomecto my, endometri osis	Abdominal pain and bleeding per rectum	CT	Surgical Excision
20	Carvalh o et al (2012) ¹² Case 1	Few mm to 50mm, pelvic and abdominal peritoneum and omentum, left ovary	32	Hysterosc opic myomecto my		USG, CT,MRI	Excision + Goserelin + Anastrozole
21	Carvalh o et al (2012) ¹² Case 2	Few mm to 20mm, pelvic and abdominal peritoneum and omentum	41		Dysmenorrhea and pelvic pain, proctalgia		LSO with partial excision of nodules + Medroxy progesterone acetate
22	Kim et al	2x1.5cm, appendix	46	Supracervi	Right lower	USG,	Surgical excision

	(2012) ²⁹			cal hysterecto my	quadrant pain	CT	
23	Huanwe n et al (2013) ²³	3.6x2.6cm, liver	29	Myomecto my	Back pain	USG,CT	Surgical resection
24	Bulut et al (2013) ¹	5-10cm, Bilateral broad ligament with pus, ectopic adrenal tissue	56		Menorrhagia and pelvic pain	USG,M RI	TAH with BSO and excision of intraligamentary masses
25	Ki Yong Na et al (2013) ²²	Caecum, descending colon and mesocolon	39	Total hysterecto my with LSO, RSO for endometri osis	Right lower quadrant pain	USG,CT	Colonoscopic + Laparoscopic resection
26	Ulm et al (2014) ¹⁹	3cm, left round ligament	49		Metromenorrh agia	CT	TAH with BSO and lymph node dissection
27	Torres et al (2015) ¹⁸	4cm, right broad ligament	58		Post menopausal bleeding	USG,CT	Total Robotic hysterectomy with bilateral salpingo- oophorectomy

28	Sopha et al (2015) ²⁵	1.4cm, Liver	47	RSO for teratoma, SCH + HRT	Right quadrant and back pain	CT	Laparoscopic excision biopsy
29	Jennifer et al (2015) ³⁵	4cm, right adnexa	64		Recurrent thigh sarcoma	MRI	Laparoscopic BSO
30	Jian He et al (2016) ¹⁵	7x4.6cm, Left broad ligament	43		Acute lower abdominal pain and hypomenorrhea	USG	Surgical excision
31	Khurana et al (2017) ²⁶	13x9cm, Abdominopelvic	47	Subtotal Hysterectomy for fibroids. Bilateral oophorectomy for endometriosis	Bleeding per vaginum	CT	Surgical excision

32	Tandon et al (2017) ²⁴	6x4.5cm, Liver	50	Laparosco pic hysterecto my with unilateral salpingect omy	Lower abdominal pain	CT	Surgical resection
33	Sampaio et al (2017) ²⁷	5cm, abdominal wall	70	Melanoma	Backache	CT	USG guided core biopsy
34	Goswam i et al (2017) ¹⁷	20x8cm, right broad ligament	46		Swelling and pain abdomen	USG, CT	TAH + BSO
35	Present study Case 1	10cm, pararectal	39	Laparosco pic right ovarian cystectom y 2 years back	Heavy menstrual bleeding, mid- cycle pain and difficulty in initiating micturition	USG	TLH with right oophorectomy, left ovarian cystectomy and excision of pararectal mass

36	Present study Case2	3cm, right round ligament	45	Laparoscopic left ovarian cystectomy 20years back, SCH 12yrs back and laparoscopic RSO and left salpingectomy 4 years back	Right lower quadrant pain	USG	Laparoscopic left oophorectomy with excision of round ligament mass
37	Present study Case 3	6cm pararectal mass, 3 cm ovarian mass	37	Laparoscopic myomectomy 5 years back	Subfertility, intermenstrual spotting, dysmenorrhea, constipation	USG	Laparoscopic excision with left ovarian cystectomy

RIF- Right iliac fossa, TAH with BSO- Total abdominal hysterectomy with bilateral salpingo-oophorectomy, HRT-Hormone replacement therapy, CT-Computerized tomography, USG-Ultrasonography, IVP-Intravenous pyelography, MRI-Magnetic resonance imaging, IVU-Intravenous urography, TLH with BSO-Total laparoscopic hysterectomy with bilateral salpingo-oophorectomy, PID-Pelvic inflammatory disease, LSO-Left salpingo-oophorectomy, RSO- Right salpingo-oophorectomy, DUB-Dysfunctional uterine bleeding, GnRH- Gonadotropin releasing hormone, SCH-Supracervical hysterectomy