Bilateral Antegrade Ureteric Stenting For Bilateral Ureteric Strictures And Endometriosis: A Case Report And Review Of The Literature

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Abstract

Background:

Ureteric obstruction from either an extrinsic or intrinsic endometriosis is rare and its diagnosis is difficult to establish unless there is a high index of suspicion due to the fact that most patients present with non-specific symptoms.

Aims:

• To report a case of bilateral ureteric obstruction emanating from bilateral pelvic endometriosis;
• And to review the literature.

Case Report:

A 32-years-old lady was admitted with a few hours history of left sided lower abdominal pain, nausea and vomiting. She stated that she was constipated and had properly opened her bowels a week prior to her admission and she has been having similar type of abdominal pains regularly prior to the commencement of her menstrual periods.

Her general and systematic examinations were unremarkable. She was given phosphate enema with good results and her symptoms resolved. She had ultrasound scan of abdomen and pelvis as well as isotope renogram which confirmed bilateral ureteric obstruction and bilateral pelvic endometriosis with a complex mass on each side of her pelvis. Retrograde catheterization of the ureters was not successful due to ureteric strictures. She underwent right salingo-oophorectomy and freeing of the right adnexa as well as freeing of the left ovary and fallopian tube. Post-operatively she had successful antegrade insertion of bilateral ureteric stents and has since then had regular changes of ureteric stents at cystoscopy for over two years and was also treated with six cycles of zoladex. She has been referred for assisted conception and will continue to have regular stent changes.

Conclusion:

Even if retrograde ureteric stenting fails in the case of ureteric endometriosis due to stricture, antegrade ureteric stenting may be successful. Gynaecologists should be encouraged to request antegrade ureteric stenting pre-operatively.

Key Words: Endometriosis; ureteric stricture; hydronephrosis; antegrade ureteric stenting; CT scan; nephrostomy.

Introduction

Endometriosis is a biologically benign albeit aggressive pathology marked by high local recurrences. Ureteral involvement accounts for only minority of cases (0.1- to 0.4%) with non specific symptoms at clinical presentation and difficult pre-operative diagnosis. A case is reported of bilateral pelvic endometriosis with bilateral ureteric strictures and bilateral hydroureteronephrosis.

Case Report

A 32-years-old lady was admitted with a few hours history of left sided lower abdominal pain, nausea and vomiting. She stated that she was constipated and had properly opened her bowels a week prior to her admission and she has been having similar type of abdominal pains regularly prior to the commencement of her menstrual periods.

Her general and systematic examinations were unremarkable. There was no evidence of any tenderness in her abdomen. She was noted to be constipated and was given a phosphate enema with good results and her symptoms subsided.

Her investigations including full blood count, serum urea and electrolytes, urine microscopy were normal. However, her serum CA 125 was raised at 86. She had ultrasound scan of abdomen which revealed two masses in her pelvis; one on each side of the pelvis (see illustrations 1-4). The scan also showed bilateral hydronephrosis (see illustration 5). The ultrasound scan findings were indicative of endometriosis. She was therefore referred to a gynaecologist and a CT scan of abdomen and pelvis was done. The CT scan showed a bulky normal ante-verted uterus; endometrial thickening; a 5.6 cm x 4.5 cm x 4.4 cm complex mass in the right adnexa, extending into the...
pouch of douglas (see illustration 6); the right ovary was not identified; the left ovary was visualised and this was associated with a complex mass in the pouch of douglas; there was also evidence of bilateral hydronephrosis (see illustration 7). Isotope renogram was done which revealed evidence of delayed drainage from both upper renal tracts (see illustration 8).

She was taken to theatre with the idea of performing cystoscopy and retrograde insertion of bilateral ureteric stents followed by laparotomy and excision of the mass in the right adnexa. Cystoscopy was done and this revealed no abnormality in the urinary bladder. Both ureteric orifices were identified however insertion of ureteric stents into both ureters were not successful because of a bend and obstruction in the ureters and the guide wires could not be advanced into the left or right renal pelvis. At laparotomy it was observed that the pelvis was completely full of endometriosis and there was a large right ovarian cyst. The area of the right adnexa was freed and a right salpingo-oophorectomy was performed. On the left side her fallopian tube was freed as well as the left the ovary which was left intact. It was decided that “bilateral – percutaneous nephrostomies” should be performed post operatively.

On the fifth post operative day, percutaneous nephrostomies were inserted (illustration 9 shows nephrostomy in-situ) and subsequently a right antegrade ureteric stent was inserted via the right Dnephrostomy channel which was followed immediately by insertion of a left antegrade ureteric stent. She was given 100mg of pethidine and 10 mg of maxolon half an hour prior to the procedure. The procedure was done in the X-ray department under antibiotic cover. During the procedure antegrade ureterogram revealed a complete stricture in the junction of the mid and lower right ureter which did not allow the Terumo guide wire to go through into the lower ureter but with perseverance and use of a stiff guide wire it was possible to negotiate / dilate the stricture to enable the insertion of a 6 Fr 26 cm antegrade ureteric stent under fluoroscopy. There was also evidence of a stricture at the junction of the mid and lower left ureter (see illustration 10) which was also negotiated in similar fashion and a 6 Fr 26 cm antegrade ureteric stent was inserted . There was no complication following the procedure.

Since the insertion of the antegrade ureteric stents (illustration 11 shows both stents), she has received six cycles of Zoladex injections as treatment for her endometriosis and her ureteric stents have been changed at regular intervals over a period of two and half years to avoid stent encrustation. Her stents have been changed at cystoscopies which have been performed under general anaesthesia and by inserting a guide wire through the channel of the old stent in situ until the guide wire has reached the renal pelvis and the position confirmed under X-ray control and then removing the old stent but keeping the guide wire intact and then inserting a new ureteric stent over the guide wire, confirming the position of the stent and then finally removing the guide wire (illustration 12 shows stents in situ after 2 tears). She has been lucky not to have developed any stent related problems so far. However, her main problem has been primary infertility for which she has been investigated as her husband. She was found not to be ovulating and her husband’s sperm quality was a bit deranged in view of this she was referred for assisted conception and the fertility gynaecologists have recommended that she should have the left fallopian tube and ovary removed because a recent hystero-salpingogram had shown left hydrosalpinx.

She underwent laparoscopy which had revealed that her left hemi-pelvis was frozen and the left ovary and fallopian tubes could not be separated to allow removal of the diseased fallopian tube.

She would continue to have regular change of ureteric stents by the retrograde method and in the event of problem with a change of her stents by this approach the stents would be removed via the antegrade approach through with the aid of a nephrostomy and antegrade removal of the old stent and antegrade re-insertion of new ureteric stents.

**Discussion**

Endometriosis is prevalent in pre-menopausal women and occurs in as many as 10 to 20 per cent with a peak incidence in 25 to 40 years age group. The disease is described as the existence of normal endometrium in an ectopic location. Ureteral obstruction from either an intrinsic or an extrinsic endometriosis is rare. Nevertheless, the gynaecologist and the urologist need to be aware of the possibility of ureteral involvement in view of the high rate of unsalvageable kidneys that ensues from this process.

Williams reported a variable incidence of urinary tract involvement (ureter and bladder) of up to 24 per cent in women afflicted with endometriosis. Involvement of the ureter by endometriosis is less frequent than bladder involvement. Abehouse and Abehouse reported 15 of 151 patients with urinary endometriosis. Williams reported 9 of 77 cases of
urinary endometriosis represented ureteral involvement. It has been stated that unilateral ureteral involvement by endometriosis is ten times as common as bilateral ureteral involvement\(^4\). The process of ureteral involvement by endometriosis is confined to the pelvic ureter. Ureteral involvement by endometriosis can be either intrinsic or extrinsic. Endometriosis involves the ureteral wall in intrinsic variety. In the extrinsic type of ureteral endometriosis there is scarring, fibrosis, and dense adhesions associated with endometrioma and this is reported to account for 75 to 85 per cent of cases\(^4\). It is also likely that there would be few cases of ureteral endometriosis that can be classified as both intrinsic and extrinsic.

The symptomatology of endometriosis is usually a reflection of the organs involved as well as the primary disease. Patients usually complain of severe dysmenorrhea as a result of sloughing of the proliferative endometrium during menstruation. The pain abates when the women are on progesterational agents that block ovulation and menstruation or during the course of pregnancy. When there is ureteral obstruction the complaints are subtle and non specific but at times the patients may present with loin pain, renal failure or urosepsis. Intrinsic ureteric endometriosis may occasionally present with haematuria.

The finding of a small, indurated, irregular, nodularity / nodularities or adherent ovary in the cul-de-sac or uterosacral ligaments is diagnostic of endometriosis\(^2\). The diagnosis of ureteral involvement of endometriosis is requires a high index of suspicion in view of the non specific symptoms of presentation. Quite often by the time of diagnosis there is either severe hydroureteronephrosis or non visualisation of the involved kidney on excretory urography due to long standing ureteric obstruction\(^2\).

Ultrasound scan of renal tract, abdomen and pelvis may reveal hydroureteronephrosis as well as ovarian / pelvic pathology. CT scan / CT Urogram would confirm hydronephrosis and ureteric obstruction as well as reveal the nature of any pelvic pathology. If the renal function is not severely impaired Excretory Urogram (IVU) could also be done and this would confirm or negate ureteric obstruction as well as depict the anatomy of the urinary tract. Diuretic isotope renogram (Mag 3 or DTPA renogram) would also confirm or negate ureteric obstruction as well as determine the differential renal function. Retrograde ureteropyelogram is helpful with regard to delineation of the lower ureter. It is usually impossible to pass a ureteric catheter beyond the obstruction, located most frequently 3 to 4 cm above the ureteric orifice. Al Saleh\(^7\) stated that rarely, a filling defect due to endometriosis is identified. Laparoscopy or laparotomy would reveal the endometriosis. The presence of an ovary filled with old retained blood which has been coined “chocolate cyst” indicates to the gynaecologist the diagnosis of endometriosis.

Rivlin and associates\(^4\) reported that estrogen-progesterin combination or danazol, a testosterone analogue, relieves the primary symptoms associated with associated with endometriosis but only occasionally relieves ureteric obstruction. Mettler and associates\(^3\) published the results of using Zoladex to treat eighty women with genital endometriosis for six months and they found: “Thirty eight patients with infertility wished to become pregnant and 16 (40%) had conceived during therapy, the serum concentration of luteinizing hormone, follicle stimulating hormone, estradiol and progesterone were significantly suppressed. All patients were amenorrhoea after 1-2 injections. Restoration of ovarian function with menstruation was occurred within 57 to 92 days after the last injection of Zoladex one to two months after end of treatment.”

The inflammatory reaction and scarring with endometriosis makes surgical correction hazardous and difficult. The procedure of choice for patients with severe ureteric obstruction and for women and for women who do not want to have further pregnancies is combined castration, total abdominal hysterectomy and ureterolysis\(^5\). If the patient wishes to have more children, and the ureteric obstruction is not too severe a lesser procedure may be attempted. The extent of the surgery is determined by area of involvement. Extensive ovarian involvement usually necessitates a unilateral oophorectomy, with meticulous dissection and removal of the endometrioma and ureterolysis. With the development in interventional radiology it is now possible for selective angiography and embolization of the endometrioma to be performed. Selim Kervanciogla\(^10\) reported a case of bronchial artery embolization in the management of pulmonary parenchymal endometrioma with hemothysis.

Serracchiiol and associates\(^11\) reported 30 cases of ureteral endometriosis (median age 33.33 years). Twenty of the patients (66.7%) were asymptomatic. Ten patients (33.2%) had specific symptoms: dysuria (30%); renal angle pain (10%); haematuria 3.3%; hydronephrosis 33.3%. Ureteral endometriosis was presumably diagnosed before surgery in 4 %. Ureteric involvement was on left 46.7%, right 26.7% and bilateral 26.7%. It was extrinsic in 86.7% and intrinsic in 13.3%. It was associated with endometriosis of homolateral uterosacral ligaments.
in all (100% of 30), the bladder in 50%, retro-vaginal septum in 80%, ovaries in 53.3% and bowel in 36.7%. The reported surgical management in this series include: ureterolysis in 73%, segmental ureteral resection and termino-terminal anastomosis in 16.7%, and segmental ureterectomy and ureterocystoneostomy in 10%. Early post operative complications in the series were fewer than 38 degrees centigrade requiring medical therapy for 7 days in 7 patients, 1 patient had transient urinary retention requiring catheterisation that resolved without further treatment. During follow-up of 14.6 months endometriosis recurred in 3 patients with evidence of ureteral involvement.

Antorelli and associates reported thirteen cases of severe ureteral endometriosis (i.e. causing significant obstruction of the urinary flow), who were observed and surgically treated. Out of 17 ureteric units affected by endometriosis (three cases of bilateral involvement, one case of complete pyeloureteral duplicity), the initial symptomatology was acute and related to ureteral obstruction in eight cases, silent and non specific in the other five; a presumptive diagnosis was made for only seven (53.9%) with a positive for pelvic endometriosis and in 2 cases also of ureteral endometriosis. Pre-operative drainage of urine proved necessary for 8 patients out of the 13 due to complete functional exclusion of the excretory axis. One patient (7.7%) underwent nephrectomy due to renal atrophy. In this series segmental ureteral resection and termino-terminal anastomoses were performed in 2 patients, while 7 patients underwent segmental ureterectomy and ureterocystoneostomy, with bladder psoas hitching in 4 cases and vesical flap according to Casati-Boari in one case. All three cases of bilateral involvement were treated by bilateral segmental ureterectomy and trans-uretero-uretero cysto-neostomy with bladder psoas hitching. Following histological examination all patients were diagnosed with active ureteral endometriosis, which was found to be intrinsic in five cases (38.5%) and extrinsic in the other eight. One of the two patients that had undergone termino-terminal anastomosis had to undergo ureteral resection and ureterocystoneostomy 22 months pursuant to the initial operation due to relapsing endometriosis induced stenosis. Conversely, no ureteral endometriosis relapses occurred in the remaining 12 patients within the mean follow-up time of 41.1 months (range 6 – 91). Antorelli and associates observed that ureteral endometriosis is marked by non specific symptoms making pre-operative diagnosis often difficult in view of these they recommended that an ultrasound scan or urographic examination of the urinary tract in cases of pelvic endometriosis is absolutely essential. Antorelli and associates stated that based upon their experience terminal terminal ureterectomy with ureterocystoneostomy has provided long term favourable results as extended ureteral resection can be performed and continuity of the urinary tract can be restored without resorting to the distal pelvic ureter, which is often affected by the disease besides being more subject to relapse.

Ureteric obstruction by extrinsic endometriosis has been reported in a postmenopausal patient. The administration of conjugated estrogens to the nulliparous patient who had undergone a previous panhysterectomy apparently played an etiologic role. The ureteric obstruction was relieved after the hormones were discontinued.

Our patient presented with the following symptoms: left sided abdominal pain, nausea, vomiting and constipation for which she was given phosphate enema with good results. Incidentally ultrasound scan and CT scan confirmed bilateral pelvic endometriosis and bilateral hydroureteronephrosis. Attempts at insertion of ureteric ureteric stents failed in view of kinks in the ureters as well as endometriosis associated ureteric stricture which prevented passage of the guide-wires up into the renal pelves at the time of surgery. However, it was possible for antegrade ureteric stents to be inserted in the XRay Department with aid of analgesia and local anaesthesia (lignocaine) under fluoroscopic control despite the complete strictures observed in the ureters and after this it was possible for the urologists to change the stents at regular intervals retrogradely at cystoscopy by inserting guide-wires through the lumen of the stents up into the renal pelves followed by removal of the old stents whilst keeping the guide-wires in situ and then inserting new ureteric stents retrogradely over the guide-wires and then removing the guide wires after correctly placing of the new stents under X-ray control despite the persistent presence of the ureteric strictures. This experience confirms the fact that antegrade ureteric stenting may be successful despite the failure of retrograde ureteric stenting in theatre. Patients with endometriosis associated hydroureteronephrosis due to intrinsic and extrinsic ureteric causes have traditionally been managed by various operative techniques including: ureterolysis, ureteric resection with terminal uretero-ureteric anastomosis, ureteric resection with uretero-cystoneostomy (with boari flap or psoas hitch), bilateral ureterectomy with trans-uretero-ureterostomy and cysto-neostomy (in case of extensive bilateral lower ureteric
endometriosis). However, in cases of extensive ureteric endometriosis involving the lower half of one or both ureters there is also the possibility of ureteric resection and ileal substitution of the lower ureter and anastomosis to the bladder with or without boari flap in the case of unilateral ureteric endometriosis and bilateral ureteric resection with transuretero-ureterostomy associated with ileal substitution of both lower ureters with the ileal substitution segment as a single conduit which can be anastomosed directly to the bladder with or without boari flap. This latter surgical technique is a suitable option for this patient however the option has not been considered in view of the fact that the she has been managed effectively with ureteric stents which have been changed at regular intervals. The fact that patients can be managed for many years with ureteric stents for other causes of ureteric obstruction would make the adoption of long-term use of ureteric stents a good treatment modality for ureteric endometriosis in comparison with other surgical techniques. With the development in stent technology, there are new ureteric stents that can be changed at yearly intervals (for example Cook ureteric stents). With regard to the patient even if she gets pregnant she can have a ureteric stents which can be changed at yearly intervals (she can therefore go through one pregnancy without the need for change of stent during the period of gestation). With the development in interventional radiology ureteric stents can also be changed antegrade through a nephrostomy in the X-ray department without the need for general anaesthesia and a retrograde technique in operating theatre. If a gynaecologist is faced with the problem of ureteric endometriosis and ureteric obstruction / hydroureteronephrosis with renal impairment the initial options of management would include: Insertion of nephrostomy to avoid renal damage or to help improve renal failure; or cystoscopy and retrograde insertion of ureteric stent(s). However, with renal failure the patient may not be adjudged suitable to be anaesthetised hence insertion of nephrostomy would be the better option. A gynaecologist who wants to perform pelvic surgery in the case of an obstructed ureter would always like a urologist to insert a ureteric to make identification of the ureter(s) at the time of surgery. Ureteric stents are usually inserted by the urologist in the gynaecology theatre just prior to the commencement of the gynaecological operation. This approach does prolong the intra-operative time and has the disadvantage of leaving the gynaecologist alone to perform the operation without a stent in case the stenting procedure fails. Ureteric stents may also be inserted by the urologist in a urology theatre at an earlier date prior to the gynaecological operation. This approach has the advantage of ensuring that a ureteric stent is safely placed prior to the gynaecological surgery however, its disadvantage lies in the fact that the patient would have to undergo general anaesthesia on two separate occasions. Since the first description of nephrostomy insertion by Goodwin and associates (4) interventional radiology has developed over the past two decades such that antegrade stents are being inserted regularly in most radiology departments. With this development antegrade ureteric stents may be inserted by the radiologist as a primary procedure at the time of nephrostomy insertion to ensure that the stent is in situ prior to the gynaecological operation or the antegrade ureteric stent can be inserted by the radiologist as a secondary procedure pursuant to the nephrostomy insertion after the renal function has been restored but the stent would be inserted prior to the gynaecological operation. The advantage of antegrade stent insertion prior to the gynaecological surgery is that it would ensure the stent is in situ prior to the surgical operation and it also has the additional advantage of being performed with local anaesthesia and analgesia thus avoiding two separate anaesthetic sessions.

Conclusions

Based upon our experience we would conclude that: Antegrade ureteric stents can be inserted in the radiology department for ureteric endometriosis induced ureteric obstruction and hydroureteronephrosis with the help of local anaesthesia and analgesia even if retrograde insertion of a ureteric stent under general anaesthesia has failed.

The use of long-term ureteric stents that are changed at regular intervals is a useful and safe method of management of endometriosis induced ureteric obstruction and this ensures that the patient's renal function is maintained for a long time.

We would recommend that if a nephrostomy has been inserted for obstructed ureter due to a gynaecological pathology then insertion of antegrade ureteric stent(s) prior to the gynaecological surgery would be advantageous.

References


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ABSTRACT
Illustrations

Illustration 1

Illustration 1: ultra-sound scan showing cystic mass in left adnexa

Illustration 2

Illustration 2: ultrasound-scan showing mass in right adnexa and in left adnexa
Illustration 3

Illustration 3: ultrasound-scan earlier showing complex right adnexal mass

Illustration 4

Illustration 4: ultrasound-scan earlier showing right adnexa mass
Illustration 5

Illustration 5: ultrasound-scan showing hydronephrosis

Illustration 6

Illustration 6: CT-scan showing mass in right adnexa
Illustration 7

Illustration 7: CT-scan showing bilateral hydroureter and hydronephrosis

Illustration 8

Illustration 8: Isotope Renogram showing bilateral ureteric obstruction with differential renal function left 68% and right 32%
Illustration 9

Illustration 9: Nephrostomy tube in situ

Illustration 10

Illustration 10: Guide-wire has been inserted into lower pole calyx of left kidney at the intitial stages of antegrade insertion of left ureteric stent
Illustration 11

Illustration 11: Bilateral antegrade ureteric stents have been inserted lower ends shown

Illustration 12

Illustration 12: Subsequently 2 years later IVU after retrograde change of stent showing left stent has slipped down a bit and needs to be repositioned.
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