# TORSION OF THE FALLOPIAN TUBE

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'On looking at the tube and its mesentery it is hardly conceivable that the tube itself should undergo torsion . . . with its broad pedicle one would not think it would twist sufficiently to cause symptoms.'[1]

Although there have been numerous case reports and reviews of tubal torsion, the condition is nevertheless quite uncommon and has persistently eluded pre-operative diagnosis in the great majority of reported cases. The following case report indicates some of the difficulties which may be encountered.

## CASE REPORT

A Coloured female aged 30, a domestic worker at the Somerset Hospital, was first seen on 21 October 1964 by the casualty officer because of pain in the right side of the abdomen and shortness of breath for one day. Nausea was present but no vomiting. On examination her temperature was 98·6°F, pulse 84 beats per minute, and respiration 20 per minute. On auscultation of the chest occasional rhonchi were present in the right lung. On abdominal examination an appendicectomy scar was noted. Tenderness was present in the right iliac fossa and the caecum was palpable. A diagnosis of bronchitis and incipient gastroenteritis was made, and treatment consisted of the administration of Madribon, Buscopan and Codis tabs.

The following day the patient still complained of pain in the right iliac fossa, and the diagnosis of pelvic infection was considered. A course of tetracycline was now commenced. She returned a day later (23 October) stating that her abdominal pain was more severe. She had been constipated for 3 days and dysuria and frequency of micturition were also present. Her last menstrual period started on 5 October 1964. A vaginal examination indicated marked tenderness in the right fornix.

A weekend intervened before she was seen at the gynaecology OPD. Her presenting complaint, pain in the right iliac fossa, had now been present for 6 days and was not quite as severe as it had been. It was intermittent and cramp-like in nature, though now a suprapubic ache was also present. Radiation of the pain from the right iliac fossa was towards the pubis and then to the umbilicus. There was no history of vaginal blood loss or of fainting. Her last period on 5 October had been normal and she had a regular cycle of 2 - 3/28 days. First-day dysmenorrhoea was present. A white vaginal discharge was present.

*Obstetric history*: One child, normal delivery, aged 2 years. She had a miscarriage at 4 months in March 1964.

The only previous operation was an appendicectomy in 1962. On questioning she stated that apart from nausea her appetite was poor since the onset of her illness, but she had not lost weight. Constipation had been present for 6 days.

On examination her temperature was 97°F, but rose to 99°F shortly after admission. There was no pallor, cyanosis or jaundice. The breasts were normal. Cardiovascular system—pulse 84 beats per minute, blood pressure 120/70 mm.Hg, Hb. 15·0 G/100 ml. Heart sounds were normal and a soft systolic murmur was present at all areas. The chest was clear. On abdominal examination marked tenderness and guarding was present over the whole of the right iliac fossa as well as rebound tenderness. No masses were felt.

On vaginal examination a white discharge was seen and several nabothian follicles were present on the cervix. The uterus was slightly bulky and retroverted, and its movement was restricted by a very tender, long, oval, firm mass, projecting anteriorly in the right fornix and lying very close to the uterus. This mass was easily palpable and slightly mobile. Movement of the cervix was painful and there was some tenderness in the left fornix but no mass.

The diagnosis was uncertain. The degree of tenderness following a course of antibiotics as well as the absence of induration, and a white-cell count of only 5,000 cells/cu.mm. were not in keeping with an adnexal infection. The absence of any period of amenorrhoea and the discrete nature of the swelling as well as its size were pointers against an ectopic pregnancy, though the degree of tenderness was such that it could not be excluded. Torsion of an ovarian cyst was considered, but, since the mass was neither cystic nor rounded, it was felt that the more likely diagnosis was acute on chronic pelvic infection.

A Gravindex test was negative and a catheter specimen of urine showed no abnormality. A broad-spectrum antibiotic was continued. A low-grade temperature persisted for a few days, but the patient was feeling much better. As the tenderness in the right iliac fossa had diminished, it was assumed that this was a slowly resolving pelvic infection. However, on reassessment 5 days after admission, some rebound tenderness and guarding persisted in the right iliac fossa, and on vaginal examination the right adnexal swelling was still markedly tender, firm, and unaltered in size. Arrangements for laparotomy were therefore made.

At operation there was a little sero-sanguinous fluid in the pouch of Douglas. A distended sausage-shaped reddish-blue organ presented in the lower part of the wound. This proved to be the right fallopian tube which had undergone torsion through two full circles at a point about a third of its length from the cornu of the uterus (Fig. 1). Gangrene and haematosalpinx of the tube distal to the torsion were evident. The fimbrial end was sealed and smoothed out, and the distal third of the tube was finely adherent to the mesentery and wall of the lower ileum. There was no band at the site of torsion, but proximal to this the tube appeared oedematous and was adherent to the mesovarium which, together with the right ovary, was drawn up against the tube. The mesovarium and ovary had, however, not undergone torsion. This ovary was firm, paler than the opposite ovary, and was enlarged to form a semi-rectangular swelling 3½ cm. in width (Fig. 1). Several small cysts were present on its surface. The left ovary had a few small cysts and the left tube was normal with a single hydatid of Morgagni (which was excised). After freeing the right tube from the terminal ileum a right salpingo-oophorectomy was performed.

Histological examination reported a haematosalpinx with dilated congested vessels in the tubal wall as well as infarction. Section of the ovary showed increased fibrous tissue and simple cysts filled with colloid-like material. In parts calcification was present.

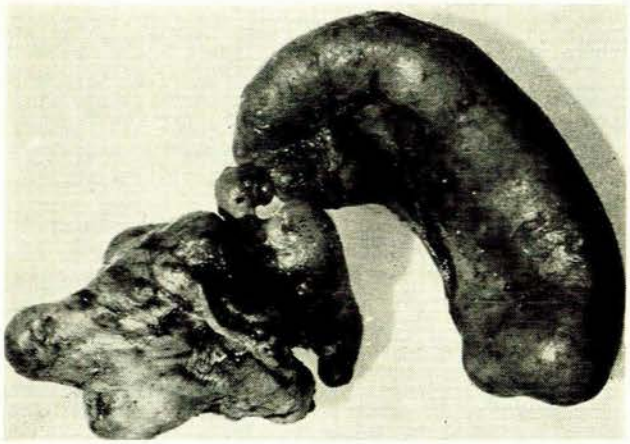

*Fig. 1.* See text.

The postoperative course was uneventful and no complications were found at follow-up examination.

## DISCUSSION

The majority of articles on this subject mention that the first case of tubal torsion was reported by Bland-Sutton[2] in 1890. There has been a marked diversity of opinion about the primary aetiological factors. Humphreys,[3] for example, regards congenital factors as important—coiled spirals are often seen in foetal tubes. He quotes Spuler's explanation that as the tubes grow in the foetus they become longer than the overlying peritoneum, and consequently tend to assume convolutions. Tortuosity may however be present in adults without any 'torsion'. A long mesosalpinx which does not reach out to the fimbriae has also been blamed, as have changes in the length and thickness of the tube and the presence of accessory ostia. Darner[4] even suggested that reflux menstruation, as propounded by Sampson in connection with endometriosis, could lead to retention of blood in the distal third of the tube, thereby giving a bulbous swelling of the tube sufficient to produce torsion.

Acquired pathology, for example a hydrosalpinx (see later) or haematosalpinx and neoplasms of the tube, have been implicated, while several authors have postulated that an autonomic dysfunction causes abnormal peristalsis of the tube.[5] Cases have also been described where a previous sterilization by the Pomeroy method had been performed.[6,7]

Pathological or physiological changes in organs adjacent to the tube have received much attention as predisposing factors to tubal torsion. Keller and Keller[8] mentioned tumours of the ovary or parovarium, while adhesions to the outer part of the tube (omental, etc.) have been noted by other authors.[9] Uterine enlargement by pregnancy or tumour has been noted on several occasions. Youssef *et al.*[10] found that either a tumour of the ovary or broad ligament or an adhesion was present in each of their 6 cases. Two patients were also pregnant and one had multiple fibromyomata. Hence they regarded changes in the neighbouring organs as the most significant aetiological factor. Unfortunately the mode of action is not at all clear, especially as conditions like uterine fibromyomata and ovarian cysts occur commonly.

Several authors[3,5,11] have claimed that trauma to the abdominal wall or sudden movements of the body play a definite part in tubal torsion. McIlroy[11] stated that trauma applied to a pelvic organ was tangential and thus in effect had a twisting movement, and that symptoms often appeared after unaccustomed trauma. Sudden changes in abdominal pressure, such as coughing or defaecation, would tend to change the position of the tube.[4] De Soldenhoff[1] discredited the idea that movements of the body and abdominal wall could be transmitted to the tube, which, after all, lies down in the pelvis. An additional mechanical factor blamed was movement and contraction of neighbouring hollow viscera.

Another factor regarded by many as significant is the presence of pelvic congestion.[5,12] This is evidenced by the fact that torsion often occurs just before a menstrual period or at ovulation. In this connection Payr's theory is often quoted.[13] Payr found that venous stasis in the pedicle of a small mobile tumour led to torsion. He showed experimentally that when the veins in such a pedicle become engorged, having a more spiral course, being longer and stretching more than the arteries, they impart a twisting motion to the pedicle. If the twist causes more circulatory obstruction, venous distension becomes greater and the torsion is increased. This theory seems especially applicable during pregnancy.

### *Pathology*

While several authors maintain that torsion can occur in a normal tube, others point out that histological changes arising from previous pathology may be obscured by changes in the tube resulting from torsion. Torsion itself may induce pathological changes in the tube resembling inflammatory changes. Youssef *et al.*[10] found that in 4 of their 6 cases the tube was grossly abnormal, and of the remaining 2, one had an inflammatory type of reaction, viz. leucocytic infiltration and giant cell formation, which, they said, was a result of torsion, since the accident occurred during pregnancy. In their remaining case (and in one of the previous 4 who had bilateral tubal torsion), the tube was bulging with sero-sanguinous fluid (like a hydrosalpinx). These authors believe that if the torsion is gradual or intermittent, occlusion of the fimbrial end may occur with subsequent distension of the tube. They based this conclusion on the fact that in both cases there was no history of pelvic infection, the other adnexum was normal, and the affected tube was mobile without adhesions. Histology of the tube wall showed no evidence of chronic inflammation. Hence they are of the opinion that many reported cases of twisted hydrosalpinx in reality occurred in a previously normal tube. This conforms with Thomas' explanation[14] of torsion of a 'hydrosalpinx' in a girl aged 13 years.

In the present case there was no previous history of pelvic infection, the opposite tube was patent and normal in appearance, and histology did not indicate any inflammatory process in the tube wall. The distal part of the gangrenous tube was adherent to the ileum, but the adhe-

sions were thin and appeared to have occurred subsequent to the torsion. The patient's history of an initial severe pain which subsided and later recurred suggests that the torsion may have been intermittent, and this would seem to be the predisposing factor to occlusion of the fimbrial end—with the production of a hydrosalpinx.

If, however, it is contended that sealing of the tube and involvement of the fimbriae is the result of infection, then it must be mentioned that in several of the reported cases the ostia were stated to be open and the fimbriae normal. In addition to such a case in a virgin aged 13, Gabe[15] had 2 cases of tubal torsion in married women. Every effort was made to establish whether latent tubal infection was present, but only the results of mechanical strangulation were found. This contrasts with his statement that after abortion, pregnancy and the puerperium there are too many possibilities of infection and mechanical derangement which may affect the structure and function of the tube. In concurring with this opinion Blum and Sayre[5] described a case of isolated torsion of the fallopian tube in a girl aged 10½ years. Nevertheless, virginity *per se* is no guarantee that the tube was not diseased before the occurrence of torsion. Anspach[13] claimed that unrecognized hydrosalpinx may be produced as a result of vulvovaginitis in childhood, genital complications of acute exanthemas, or 'attenuated' tuberculosis. A further difficulty in distinguishing normal from infected tubes is the claim that unilateral hydrosalpinges are occasionally seen and that torsion of a normal tube immediately produces an identical picture, viz. closure of the fimbrial end, formation of hydrosalpinx, and haematosalpinx.[16] In most cases of haematosalpinx not due to ectopic pregnancy, the cause is torsion of the tube, usually the uterine end.[11]

In the present case the ovary on the affected side was enlarged and firm like a fibroma with a few small cysts and was not itself involved in the process of torsion. The extent to which this 'heavier than normal' ovary may have predisposed to the onset of the tubal twist is obviously difficult to determine. As may be expected cases have been reported where an ovary, normal or abnormal, was involved in the torsion,[17,18] while other cases have been described where the ovary was healthy and uninvolved.[1,14,16] In Kohl's case[6] a cystic right ovary was present which was not twisted, but this was said to have predisposed to the initiation of the tubal torsion. In a description of a very rare case of bilateral tubal torsion[9] a dermoid cyst of the left ovary was present and the right ovary had several small cysts, but neither took part in the torsion process. Of the 6 cases of Youssef *et al.*,[10] one was stated to have been definitely brought about by the twist of a broad ligament cyst, and the ovary shared in the process of torsion. In another case a simple cyst of the ovary was twisted and seemed to have predisposed to the tubal torsion.

*Clinical Features*

Pain, the most important symptom, is sudden in onset[6,19] and paroxysmal in nature.[14,18] From his review of reported cases Kohl[6] suggested a pattern of symptoms, viz. the sudden onset of colicky pain, in either of the lower quadrants, which is often described as extending from the flank into the groin and on occasion radiates to the lateral or anterior aspect of the thigh on the same side. When the pain is present mainly in the right iliac fossa it may simulate acute appendicitis. Several writers have stated that the pain classically begins in the loin or extends to the loin,[6,9,18] and this is even given as a differentiating feature from torsion of an ovarian tumour.[10] There is no explanation why loin pain should occur at all in tubal torsion, but if it is present there will be obvious confusion with renal or ureteric disease. In this patient loin pain was entirely absent. The pain did, however, radiate from the right iliac fossa to the pubis, and radiation to the pubis or thigh has been well recorded.[9,18]

Other symptoms may be slight or absent. Though Kohl reported nausea and vomiting as common, most reports indicate that these symptoms are not commonly associated.[10] This contrasts with ovarian torsion or torsion of hollow viscera. Transient nausea was present in this case. Uterine bleeding from secondary vascular engorgement has been described.[1,10,12] Abbas[12] said that bleeding follows the onset of pain and contrasted this with the absence of bleeding shortly after torsion of the pedicle of an ovarian cyst. However, an imminent menstrual period may account for the bleeding.

A prominent factor on examination is the good general condition of the patient despite the severity of the pain.[14,16] This applied in the present case and is also usually the case in most patients with twisted ovarian cysts, but ruptured ectopic pregnancy is clearly differentiated. The temperature may or may not be slightly elevated, but the increase in the pulse rate seldom exceeds 100 beats per minute.[6] Leucocytosis, if present, is mild.[9] These latter features differ from those of infective conditions like appendicitis and salpingitis. Tenderness and rigidity on abdominal examination are initially slight—later they are more marked and tend to extend from flank to groin. Abdominal palpation of the twisted tube is quite unusual, but bimanual examination will reveal a mass. Vaginal examination sometimes elicits cervical tenderness and a tense, tender mass is usually felt; or Warneck's sign of feeling the tender, tense pedicle of the pelvic swelling when moving the uterus to the opposite side, may be elicited.[10]

The presence of intraperitoneal sero-sanguinous fluid, obtained by aspiration of the pouch of Douglas,[12] may influence one to perform laparotomy sooner than otherwise. However, culdoscopy is a more promising diagnostic procedure for future use and is the only way that the diagnosis may be confirmed before laparotomy. Intravenous pyelogram and cystoscopy[20] are useful in excluding urinary tract disease if time permits.

In his review Shute[21] found that 80% of cases occurred during the reproductive life of women and 20% before or during puberty. Bilateral tubal torsion is excessively rare—after finding that 12 cases had been recorded, Youssef *et al.*[10] added one of their own.

*Treatment*

If the diagnosis could be made early some otherwise normal fallopian tubes could undoubtedly be saved. If, at laparotomy, the torsion is less than a full circle,[10] and the tube not only appears healthy but regains its normal colour and vitality on undoing the twist, then the tube should be

saved. Furthermore, it is suggested that the tube should then be fixed down to prevent possible future episodes of torsion.[22] Obviously the abnormal or gangrenous tube must be excised.

The ovary on the affected side is conserved if it appears entirely healthy. In many of the reported cases, however, the ovary was either the seat of pathology or was involved in the torsion, and had to be removed.

SUMMARY

A case of torsion of the right fallopian tube in a parous patient, aged 30, is described and the aetiology and pathology, clinical features and treatment are discussed and reviewed.

I wish to thank Dr. R. Nurock, Superintendent of the Somerset Hospital, for permission to publish.

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