PELVIC ABSCESS IN GYNAECOLOGICAL PRACTICE

A CLINICAL ANALYSIS OF 80 CONSECUTIVE CASES

H. J. H. CLAASSENS, M.B., CH.B., M.MED. (O. & G.), M.R.C.O.G.*

Late Registrar, Division of Obstetrics and Gynaecology, University of Cape Town and Cape Provincial Administration

The ready response of inflammatory states to modern antibiotics has led to a feeling of security, if not complacency, by those who have to deal with these conditions. In marked contrast to this were the helplessness and anxiety of the doctor and the suffering of the patient, in the presence of severe inflammation, little more than a decade ago. It was surprising to find that the number of patients suffering from pelvic abscess admitted to the Gynaecological Unit of the Groote Schuur Hospital, did not appear to be decreasing significantly. In order to study this problem and to reflect its true significance in this modern age, I made a detailed study of each case admitted between January 1956 and June 1957. A total of 80 cases were collected, of which 71 were dealt with by me.

The term 'pelvic abscess' denotes an abscess in any part of the pelvis but not necessarily confined to the pelvis. Pyometra is usually excluded because it forms a separate entity. This series therefore comprises those abscesses which present initially or ultimately in the pouch of Douglas. It is generally agreed that the condition is mainly found among the lower socio-economic classes, and the present series is confined to this group. Johnson[1] states that 'reports in the literature (of abscesses) are apparently scarce despite the abundance of such cases which should have decreased since the advent of sulphanilamides and the antibiotics.' The Groote Schuur figures for 1946 and 1956 only partly bear out this statement while they illustrate the predominating occurrence at present of abscesses in the Coloured population. For instance in 1946 there were 881 gynaecological admissions (320 White, 505 Coloured and 56 Bantu), of which 40 were cases of acute pelvic infection, and 16 cases of pelvic abscess (1·8% of all admissions—2 White, 12 Coloured and 2 Bantu). Abscesses therefore constituted 0·62%, 2·4% and 7·6% of the total admissions in the various racial groups.

In 1956 the total admissions were 4,446 (1,912 Whites, 2,059 Coloured and 475 Bantu), of which 143 were cases of acute pelvic infection (11, 113 and 19 respectively) and 54 (1·2%) cases of pelvic abscess (3, 46, 5); abscesses therefore now constituted 0·2%, 2·2% and 1% of all admissions in the various racial groups. It will be seen that the actual incidence of pelvic abscess has decreased by a third, from 1·8% to 1·2%, with the Coloured contribution virtually unchanged at 2·4% in 1946 and 2·2% in 1956.

The abscess developed in less than two weeks in 55 cases. In 4 cases only it started as an exacerbation of a chronic inflammatory state, in 2 of which it followed abortions 8 and 10 years before. Some patients developed abscesses with surprising rapidity, often even within a few days of the onset of the inflammatory state (Table I). In 42 cases (52·5%) no obvious cause for the inflammation was found, while in 38 cases the following factors in order of frequency were considered to have aetiological significance.

TABLE I. PELVIC ABSCESS (80 CASES). DURATION OF INFLAMMATORY SYMPTOMS BEFORE ADMISSION

1– 3 days	9	2– 3 weeks	8	1– 2 years	2
4– 7 days	18	4– 8 weeks	6	3–10 years	2
8–10 days	18	9–12 weeks	5		–
11–14 days	10	3–12 months	2		4
	55		21		

1. Childbirth or abortion, especially the criminal variety, resulted in acute inflammatory states with subsequent abscess in 5 cases, and in milder states of infection, which subsequently became acute, in 5 cases.
2. Operative intervention was considered responsible in 4 cases (1 after total hysterectomy, 2 after diagnostic dilatation and curettage and 1 after cervical cautery) while 3 abscesses followed operations for ruptured tubal pregnancies.
3. Acute cervicitis (large erosion) and vaginitis were probably responsible in 2 and 3 cases respectively.
4. Contiguity with the alimentary tract was the responsible factor in 6 cases (diverticulitis in 2 cases, appendicitis in 2 cases and strongly suspected in another, and non-viable secondary abdominal pregnancy in 1 other case, who developed a *B. welchii* infection which led to an abscess.

* Now of Hammersmith Hospital, London.

5. Old-standing pelvic inflammatory states preceded 4 abscesses.
6. Investigation into infertility led to infection in one patient after a salpingogram, and in another after tubal insufflation following salpingostomy.
7. Probable blood spread in an unoperated ruptured tubal pregnancy with a large haematoma.
8. Radium insertion for cervical carcinoma (1 case).

In addition to these some other causes, not encountered in this series, are usually listed: intestinal perforation due to peptic ulcers, trauma or diverticulitis, rupture of the bladder with urinary extravasation, and primary or secondary peritonitis, in which Fowler's position may be of significance.

A mixed growth of organisms was cultured soon after the appearance of the abscess, or it was found that the abscess became sterile (55% of cases) if left a few days longer although the pus might still be extremely foul-smelling. Gonococci are stated by most authors to be the commonest organisms present. This claim is, however, not supported by a critical perusal of the bacteriological findings as reported in the literature, and it was not proved in any one of the present cases, probably because of the notorious difficulty in proving gonococcal origin even with the gonococcal complement-fixation test. This test was not used in Cape Town and no reference to it could be found in any other published series. Black[2], however, is 'convinced' that gonococcal infection is always the cause of tubo-ovarian abscess. Johnson *et al.*, in their series of 93 abscesses, found no gonococci in 9 positive growths after 33 attempts and yet they consider gonococcal infection the aetiological factor in most cases. Altemeier[3] in almost 1,200 collected cases of ovarian and tubo-ovarian abscess found gonococci in 18%. According to Stern[4] other rare organisms are pyocyaneus, tetanus and actinomycosis, while Black states that 95 %of all tubo-ovarian abscesses are due to blood spread streptococci. Haultain[5] found that of 84 cases of tubo-ovarian abscess, of which 54 were acute and 30 chronic, 22 were of tuberculous origin. In 60 of the present cases guinea-pig inoculation or Kirshner cultures were performed without a single positive result. In Table II organisms found in the present series are compared with those of Altemeier[3] and Jensen[6].

TABLE II. ORGANISMS FOUND

Author	*Description*	*Cases*	*Sterile*	*Gonococcus*	*Staph. or Strep.*	*E. Coli (or coliforms)*	*C. welchii*	*E. Coli + P. Aeroginosa*	*E. Coli + M. aureus*	*B. typhosus*
Altemeier	Tubo-ovarian	25	2 (8%)		22					
Altemeier (collected)	Tubo-ovarian and Pyosalpinx	1,179	632 (53%)	212 (18%)	105 (9%)					
Jensen	Pelvic Abscess	328	89 (27%)		52* (16%)					
Present series	Pelvic Abscess	80	45 (55%)		15 (19%)	10 (12·5%)	1	3	5	1
								10 (12·5%)		

* Mixed bacteria 136 (45%).

Symptomatology

The symptoms depend on whether the condition was acute, chronic or recurrent and often the general state of toxicity was more prominent than the local one. Pain was the commonest feature, present in 96% of patients (95% in Johnson's series and 100% in Jensen's). The pain was only occasionally throbbing or stabbing; usually it was persistently dull or sharp. Stern considers that an acute abscess with a swollen tube and peritoneal involvement may cause severe pain while chronic cases may have mild discomfort only, and that urinary upsets are often present. In this series dysuria alone or with frequency occurred in 50% of cases, while frequency alone was rare and retention occurred only once. Stern also considers that recurrent or chronic cases with scarring and adhesions may be more painful and that they may also experience menorrhagia, dysuria, backache, painful defaecation and general ill-health. Such cases may occasionally be deceptive. For instance, in the case of one patient who was admitted for myomectomy with typical symptoms a large abscess with 2½ pints of pus and a normal uterus were found; the abscess developed insidiously after cervical cauterization 3 months before.

Constipation occurred in 23% of cases, diarrhoea in 17% of cases, usually the very sick and toxic and only 4 cases with low fluctuant abscesses had loose mucous stools, probably due to the policy of early incision, while 10% had tenesmus. Vaginal discharge varied from profuse and offensive to scanty yellow or white; the discharge was often more profuse in the more chronic cases. The menses were unchanged in the majority (82·5%) of menstruating cases. Eleven patients were subject to prolonged menstrual bleeding for 1-3 months, 3 to scanty menses and 1 to amenorrhoea for 1 month, while 30% of all cases including 2 post-menopausal cases, had experienced non-menstrual vaginal bleeding. The significant feature here was that the inflammation had started during or immediately after the menses in 28 (45%) of the patients. This excludes the 10 non-menstruating cases (7 following childbirth, abortions or ectopic pregnancies, 2 post-menopausal and 1 post-hysterectomy).

Signs

The dictum pronounced by Jensen that 'there is usually a tender lower abdomen, often bilateral and perhaps localized, with usually a mass on one or both sides which occasionally fills both' usually held true. The mass may be entirely within or encroaching from outside the pelvis upon the fornices, especially the posterior one, and the size may vary from a capacity of 50 c.c. of pus to very large abscesses extending to the umbilicus. Tenderness and inflammatory oedema may mask the presence or size or fluctuation of an abscess. Greenhill[7] advises needling and incision of the abscess as soon as it is suspected and not when fluctuation is obvious. Pus

will be present when the mass is palpable, long before the classical signs are apparent. This fact was confirmed in the present series. The author was often asked to see cases of suspected abscess only to find an abscess already well established. 32·5% of abscesses were not fluctuant at all when drained of varying quantities of pus; the rest were fluctuant. In 30 cases more than 1 pint of pus was drained (in 13 more than 2 pints), in 21 ½ pint, and in 29 less than ½ pint. Only 9 cases showed no marked tenderness on examination. Thirty-six cases were very toxic, 26 were moderately toxic, 13 showed little evidence of toxicity, and 5 were not toxic at all. The abscess was located in the posterior fornix only in 36 cases (45%), in the posterior as well as in the right fornix in 17, in the posterior and left fornix in 12, and in the posterior and bilateral fornices in 15. The consistency of the pus varied from inspissated to milky, its smell from foul smelling to odourless and its colour from creamy yellow to brown and frothy (*B. welchii* pus). No constancy was found between the type of pus and the size, duration or severity of the condition.

Investigations

While Stern holds that a high vaginal swab will reveal the organisms on culture, routine bacteriological studies and culture of cervical swab specimens in 50 cases failed to confirm this: 28 cases yielded no growth, 10 grew coliform bacilli (only 2 of these having this organism in the pus), 6 *Micrococcus pyogenes aureus* (2 had this organism, 2 aerobacters, 2 enterococci) and 2 *Streptococcus viridans* (all unrelated to the pus findings). In 38 of these cases the swab specimens had been taken before the start of antibiotic therapy, but in only 2 instances were the same organisms then found in the pus. The same 50 cases had catheter specimens of their urine examined and in only 8 were organisms found, usually coliform, but again there was no correlation to the pus findings.

The initial haemoglobin level was found to be less than 10·5 g.% (70%) in 15 cases, while several developed lower levels within a few days. This reading as well as the sedimentation rates and white-blood-cell counts were found too equivocal to be of any use in differentiating the 5 cases of ectopic pregnancies from abscesses. The results ranged from 15·70 mm. per hour (Westergren) and 15-22,000 cells per c.mm. in both conditions.

Chest X-ray photographs were taken in 31 cases with none showing lung pathology, but in one case symptomless tuberculous osteitis of a rib and of one humerus was found. Guinea-pig inoculations or Kirschner cultures were performed on the pus on 60 occasions with negative results, while serological tests for syphilis were positive in 5 out of 24 cases (20%). Barium enemata excluded diverticulitis in 5 cases over 40 years of age.

General Facts

Of the 80 patients 46 were under 30 years of age, 24 were between 31 and 40, 7 between 41 and 45, 2 were 49 and one was 60 years of age; and of the 77 patients in the child-bearing age, 13 had never been pregnant while 3 had had an abortion only. Drainage had been instituted on the day of admission in 41 cases, within 3 days in 7, between 4 and 7 days in 15 and between 1 and 2 weeks in 17. Delay usually occurred in patients with peritonitis, very acute inflammation, or severe toxicity. In some cases an abscess developed or became apparent or gravitated posteriorly after a delay. However, in 9 cases the abscess was missed for several days. Antibiotics may mask the typical swinging temperature of pus which may be present after a day or two, e.g. a patient was admitted with pelvic peritonitis 2 days after a successful tubal insufflation performed 6 weeks after salpingostomy. Despite intensive antibiotic therapy a small right-sided mass developed after a few days and went on to a large mass which gravitated into the posterior fornix, all within 7 days. Then 2 pints of pus were drained, still without any swinging of the temperature.

Diagnosis

Careful history-taking and physical examination usually sufficed, but on 9 occasions it was necessary to do a colpopuncture (also known as cul-de-sac needling or puncture, or culdocentesis) in order to distinguish abscess formation from ruptured tubal pregnancy with pelvic haematoma (which condition may simulate an abscess), hydrosalpinx, ovarian cyst and infected dermoid cyst of the ovary with a large sympathetic serous collection in the pelvis. Laparotomy was performed in these patients.

Colpopuncture is a very safe procedure. Beacham and Beacham[8] describe 500 cases in which it was performed in clinic rooms while Schultz[9] (over 2,000 cases) states that 'bowel penetration is a quite harmless accident'; invariably small bowel is involved (20-30 instances in his series); that bleeding, although more serious, can be controlled by stitching or packing; and not only that no case of internal bleeding was noticed, but that no case of infection had been seen. Bremer[10] found preliminary local anaesthesia with a dental syringe a satisfactory procedure in more than 100 cases, while I used a long thin needle or a syringe, without any anaesthesia, on 9 occasions for diagnostic purposes without any trouble. Furthermore, Schultz states that no harm follows the needling of parametritis in the absence of an abscess and that this may indeed be beneficial. This occurred in one case in this series. It is, however, important to follow the posterior mid-line closely when needling is carried out for fear of perforating the ureter or the uterine vessels.

TREATMENT AND ITS RESULTS

The following scheme has been evolved:

1. *Prevention*

Discharges and erosion should be treated effectively and aseptic technique used at childbirth, evacuation and curettages should be impeccable, surgery should be gentle with effective haemostasis, and as much blood as possible should be removed in cases of ectopic pregnancy.

2. *Immediate Treatment*

(*a*) General measures such as intravenous therapy may be indicated before drainage in the very toxic cases, or good diet and vitamins in the malnourished. Broad-spectrum antibiotics should be freely used because most organisms are sensitive to these drugs. Cervical bacteriological studies or routine sedimentation rates or white-cell counts do not seem justified but chest X-rays and serological tests for syphilis should be used as a routine.

(*b*) While Stern suggests that conservative therapy may be tried for a few days with small collections of pus, 5 very toxic cases showed dramatic improvement after raindage of

50 c.c. of pus. This suggests that drainage should be instituted as soon as possible. Colpotomy or mid-line incision in the posterior fornix should be performed *as soon as* a mass is suspected there or reaches it from elsewhere in the pelvis or abdomen. It is unnecessary to await fluctuation, and light anaesthesia usually suffices. This policy of early drainage failed only once when an acutely tender patient was found to have a retroverted uterus and no abscess. It may have dramatic results, as in the 2 cases (one an uncontrollable diabetic) who were thought to have parametritic thickening only but yielded 2 pints of pus each, without any fluctuation being felt at all. It is important to break down loculi with

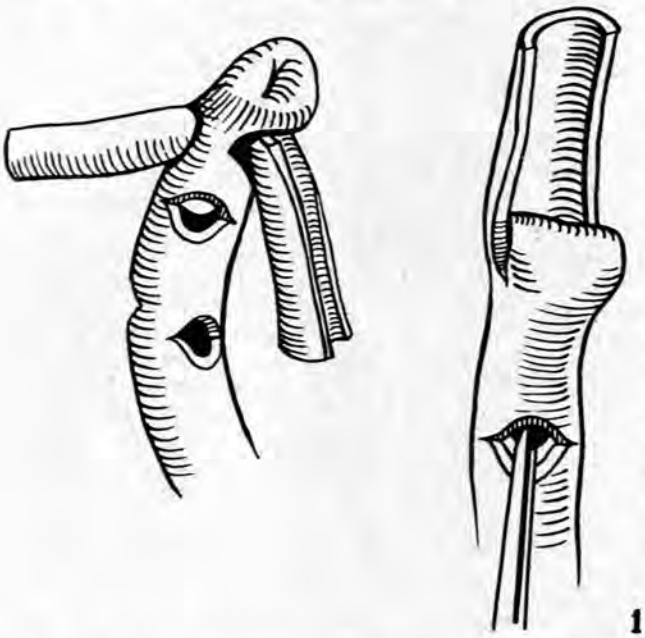

Fig. 1. A pelvic drain made from soft rubber tubing (on the right) with an artery forceps pulling through one flange. The completed drain is easily inserted, is effective, may be removed by a simple pull and can be cut off flush with the vulva.

the finger, otherwise drainage may be valueless, and to insert a drain of some description (Fig. 1), although Stern considers this unnecessary. It was found impossible to recognize organs with the finger in the abscess cavity.

Tupper[11] simply aspirated the abscess and injected penicillin and streptomycin up to 3 times in 14 cases; only 2 cases required subsequent surgery. Collins and Tucker[12] injected streptokinase and streptodornase through the drainage tube daily for 4 days in 11 cases. The propounders of both methods claim shorter stay in hospital for patients, but neither method was used in this series. When the abscess is anterior to the cervix abdominal drainage is indicated by a small incision over the mass with simple drainage, bilateral if necessary, as advocated by Stern. There were 2 such cases and although neither showed fluctuation, both yielded about 2 pints of pus. One developed from a slight thickening in the anterior fornix to a full-blown abscess in 6 days, while at operation a salpingogram done experimentally showed normal tubes. The other had a concurrent laparotomy for volvulus due to adhesions caused by the abscess, but the patient subsequently died—one of the 2 deaths in this series. Conservative treatment in saving the follopian tubes in such cases may be rewarding. One knows of at least one patient in whose case bilateral tubo-ovarian abscesses were found at laparotomy, who became pregnant within 4 months after discharge. Broad-ligament abscesses, which are very rare, may be drained extraperitoneally.

(*c*) Complications should be prevented or treated if already present. Instances of such complications are an anaesthetic or operation on toxic patients, broad-ligament abscesses which point in the groin, buttock, renal area etc., and peritoneal abscesses which rupture into the rectum or bladder (this happened in one case in this series and it led to a self-cure) or into the peritoneal cavity, which may be catastrophic unless recognized early. Early recognition may, however, be very difficult in an already very toxic patient. Stern advocates simple suprapubic drainage in such circumstances, while American authors[13-16] advocate removal of all the pelvic organs. While no such case was encountered in this series, I feel that the latter view is possibly too radical in these days of antibiotic and intravenous therapy. Finally, the development of the state of 'chronic pelvic infection', of long-continued ill-health and of misery should be prevented as far as possible. In this connection Hurtig's so-called 'combined treatment' with the anti-inflammatory cortical steroids and proved specific antibiotics in resistant or recurrent pelvic infections, is of great interest.[17] Dramatic results are claimed though Hurtig emphasizes the preliminary nature of his report and the fact that only specific antibiotics and not any broad-spectrum antibiotic should be used. One fails to see, however, how the sensitivity of organisms can be ascertained when they are localized and intra-abdominal. Further reports are awaited with interest.

3. *Subsequent Treatment*

(*a*) Chemotherapeutic 'cover' should probably be used during the next menstrual period; 5 patients had recurrences at that time, while 36 others had no known recurrences during a 5-day period under a covering course of sulphanilamides.

(*b*) Patients should be seen at regular intervals for the first few months after discharge to exclude and treat residual or recurrent pathology. Of the 34 patients that re-attended 5 had recurrent and persistent low-grade inflammation, 1 had an exacerbation of a probable appendix mass, 2 became pregnant soon afterwards, 4 had persistent adnexal thickening or parametritis and 2 others qualified ultimately for late surgery.

(*c*) Patients should be readmitted after about 3 months in order to exclude underlying tuberculosis in cases of obscure aetiology or of appendicitis if the mass had been right-sided. On investigation of 12 cases all were found to be normal with reference to X-ray examination, sedimentation rate, curettage, guinea-pig inoculation or Kirschner culture examination; 6 hystero-salpingograms were normal; 1 revealed a large residual hydrosalpinx (the patient eventually qualifying for late surgery) and 2 appendicectomies were performed. At these two operations, the organ in one case was still full of pus and oedematous; in the other it was fibrosed and adherent. Two other patients whose abscesses almost certainly originated in the appendix could not be examined because they failed to turn up for examination.

4. *'Late' Surgery*

While there is on the whole a natural tendency towards improvement, especially at the time of the menopause, there is a definite group that may require late surgery. The indications, for surgery described by Haultain, are as follows: continued ill-health, constant misery with pain or menorrhagia, inability to work or to perform home duties adequately or to enjoy life. It is generally accepted that this group of patients need total removal of the pelvic organs. Two patients, in the present series, fell into this category; both were over 40 years of age. The Falk[18] procedure of cornual resection should probably be reserved for cases with recurrent attacks where the pelvis is 'frozen' with adhesions as so often occurs in the Bantu. The procedure seems a successful one in such cases.

Mortality Rate

There were 2 deaths in this series. One has already been described and the other occurred in a very toxic patient with an abscess following a septic incomplete abortion, before drainage was instituted. Autopsy revealed septicaemic findings and multiple pelvic abscesses, mostly above the posterior fornix. The mortality rate therefore in the 80 patients was 2·5% compared with Johnson's 0·93% in 93 cases and Jensen's 5·7% in 328 cases.

CONCLUSIONS

1. While the exact aetiology in most cases of pelvic abscess remains obscure, the menstrual state seems to be of some significance, probably because the defensive cervical plug of mucus is washed away and the pooling of the menstrual flow with the endometrial slough may form a nidus for infection.

2. The incidence for all races treated in the Groote Schuur Hospital has decreased by a third in the past decade, but that for the Coloured patients remains virtually unchanged, namely 2% of all Coloured gynaecological admissions.

3. No correlation was found between organisms cultured from the cervix and from the pus. No proof of the gonococcal aetiology of abscesses could be found, although the necessary investigations demand an extremely difficult technique which was not employed in this series.

4. Inflammatory masses in the posterior fornix should be incised early without necessarily awaiting fluctuation, which may be masked by tenderness and inflammatory swelling.

5. Cases should be followed up regularly. The first period should be 'covered' with antibiotics and the cases readmitted after 3 months in order to exclude or treat possible underlying conditions, e.g. tuberculosis or appendicitis. At this time routine appendicectomies are suggested for right-sided abscesses, because appendicitis cannot be excluded; it often tends to be recurrent and it can be safely cured.

6. The 'combined treatment' regime of Hurtig in recurrent or resistant cases is of great interest but the regime seems too experimental for general use at present.

7. A few selected cases may qualify for 'late' surgery. This should entail total removal of the female pelvic organs.

SUMMARY

A series of 80 cases of pelvic abscess, of which 71 were treated by the author, is analysed in detail and compared with other series reported in the literature. A scheme of treatment has been evolved and certain recommendations suggested, especially concerning the importance and value of the subsequent follow-up care of these patients, which has not been emphasized before.

SAMEVATTING

'n Reeks van 80 opeenvolgende gevalle van bekkenabses, waarvan 71 persoonlik behandel is, word ontleed en vergelyk met ander reekse en referate. 'n Plan van benadering, behandeling en nabehandeling word aangebied en veral word die belangrikheid en aanduidings van die bogenoemde plan van benadering, sover bekend, vir die eerste keer beklemtoon. Verskeie gevolgtrekkings word gemaak en bespreek.

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