

## CULDOSCOPY

by

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Accurate diagnosis has been a problem in all branches of medicine. The gynaecologist is, however, able to palpate most pathological conditions in the pelvis with an exactness that requires no presumption. The modern methods of investigation like cytology, biopsy, hormonal assays, radiological investigations like hysterosalpingography, gynaecography and pelvic angiography make the problem easier, yet there remains a case, an occasional case, that is difficult to diagnose with certainty.

Laparotomy in such a case, on the off-chance of finding something, is the mark of a lazy surgeon and the patient full of complaints is the victim. Provisional diagnosis should be made and a proposed operative procedure should be planned before the laparotomy is even thought of. Sometimes a diagnosis is missed which may lead to unnecessary and even dangerous conservatism in the hands of even an experienced gynaecologist. It is here that culdoscopy, a gynaecological procedure which combines cul-de-sac puncture with telescopic visualization, plays an use-

ful role. Culdoscopy may be called a peep through a key-hole to scrutinise the nature of contents and to find out the culprit.

It was Dr. Albert Decker, who conceived the possibility of transvaginal endoscopic examination of the pelvis and devised both the method and the instrument which have proved so successful. This was as early as 1936. In 1962, Clyman invented his panculdscope with better visibility and arrangement for minor operative procedures and motion picture photography.

In 1944, Decker and Cherry made a preliminary report of the procedure. Buxton made a critical study. In 1950, Tenton gave an excellent account of culdoscopic appearances of ectopic pregnancy and pelvic infection. In 1957, Te Linde reported on his experiences of 594 cases. Three years later Albert Brown published a study of 205 cases. Recently Riva has stressed the role of culdoscopy in diagnosis of early ectopic pregnancy. Green also published a report of study of 545 cases carried out during the last 9 years. In 1963, Billingsley *et al.* reported the results of culdoscopy in 450 cases.

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### Material

The study of this procedure was

undertaken to find out its value as a diagnostic tool. This report is intended to be the statement of results obtained in this series of 25 consecutive cases. After the preliminary difficulties of the early cases was surmounted the visualisation of the pelvic organs was both easy and adequate.

Table I; shows the indications in this work:

TABLE I

Indication	No. of cases
1. Sterility	(a) Primary 7 (b) Secondary 4
2. Menstrual disorders	(a) Menorrhagia 1 (b) Pr. amenorrhoea 2 (c) Sec. amenorrhoea 5
3. Pelvic lump	.. .. 1
4. Suspected pelvic pathology	.. .. 2
5. Chronic pelvic pain	.. .. 1
6. Hirsutism & anovulation	.. .. 2
Total	.. .. 25

*Pre-Examination Care*

The usual pre-operative procedures were carried out. Premedication consisted of injection atropine 0.6 mg. i.m. supplemented by inj. morphia 15 mg. in case local anaesthetic was to be administered. Decker says that for emergency cases like suspected atypical ectopic or an acute appendicitis, simple enema may be omitted.

The position in which the patient will be examined must be explained to her. The modified knee-chest position is a very awkward position for any patient to maintain. A co-operative patient is easier to work with.

*Anaesthesia*

The choice of an anaesthetic agent varies from case to case. The emotional status of the patient, the size of the vulval orifice and the vaginal canal and the nature of the pathological condition suspected have an important bearing on the choice of anaesthesia. Clyman uses 2% xylocaine on either side in the base of the broad ligament and then locally in the vaginal vault around the proposed site of puncture. Saddle block, epidural and general anaesthesia have been used by different authorities. Table II compares the choice of anaesthesia in this series to the workers from the west.

In early cases low spinal was used as it allows freedom of manipulation over a satisfactory period and is preferred when dilatation and curettage was to be done along with culdoscopy. In the later cases we observed a progressive switch over to the use of local anaesthesia as the one of choice.

*The Position of the Table & the Patient*

A table which allows absolute

TABLE II  
*Anaesthesia*

Author	No. of cases	Local	Low spinal	General
Billingsley .. ..	444	90.7%	6.7%	2.6%
Te Linde .. ..	594	—	10%	90.0%
Present series	25	48%	52%	—



symmetry, stability and that permits exaggerated lordosis and suspension of the abdominal wall well above the table is a necessity. The patient needs to be placed in knee-chest position.

Fig. 1: explains the principles of the table essential for culdoscopy.

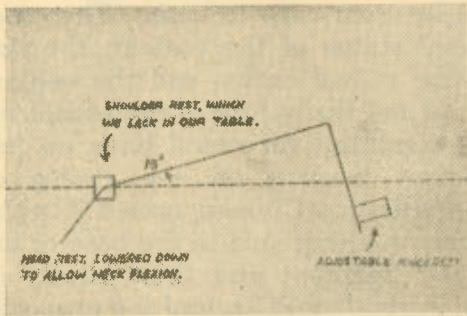


Fig. 1

Fig. 2: In the present series, a general surgical table with modification of knee-rest satisfied our requirements.

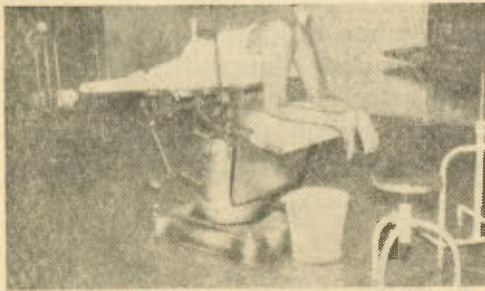


Fig. 2

The knee-rest was devised by Riva at Walter Reid Army Hospital. This shows that no complex or elaborate fixtures are necessary for conducting a culdoscopic study.

*Technique*

The patient is placed in the lithotomy position and vaginal examination is made to confirm the findings. The patient is then placed in a modified knee-chest position. Vulva and vagina are painted and draped with sterile towels. Sim's speculum is introduced over distal  $\frac{3}{4}$ th of the posterior vaginal wall and is held taut compatible with the comfort of the patient. The posterior lip of the cervix is held with a vulsellum and pulled towards the symphysis pubis, taking care not to obliterate the concavity of the vaginal vault. Local infiltration is now done. With the above manipulations a dimple comes into view at the apex of the posterior fornix. Lateral to the dimple lie the uterosacral ligaments. (Fig. 3). The

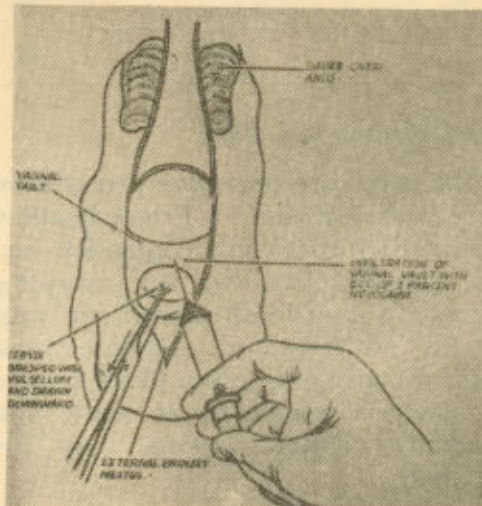


Fig. 3

trocac and the cannula is now firmly stabbed into the dimple. The perineal retractor is now relaxed and the telescope is inserted through the

cannula. This confirms the perforation of the pouch of Douglas. The pelvic structures are visualised in a serial order. Tubal patency can be tested at this stage by injecting 10 cc. of sterile solution of indigocarmine through the self-retaining cervical cannula.

After the visualization is over, the telescope is withdrawn. The cannula remains in situ. The table is adjusted to the horizontal position, pillows are placed under the patient's abdomen to assist in the expulsion of air from the peritoneal cavity. The patient is now placed in supine position and the cannula is removed. Jeffcoate believes it is wise, if not essential, to close the vaginal puncture hole with one catgut suture. This was done in 3 cases in this series.

#### *Aftercare*

The patient is placed in head-low position for an average period of 8 hours and antibiotics administered for 48 hours. Oral fluids are given on the same evening and a full diet on the following morning.

#### *Results*

Much experience had to be gained about the appearance of the pelvic organs in a normal case, their size and relationship. It must be remembered that the magnification depends upon the distance between the object and the objective. The visual field is of 1.75 inches at 1 inch distance, hence one structure was to be traced to find out relation with another. Needless to say that the success and the accuracy of such an endoscopic procedure is in direct proportion to the experience of the endoscopist

concerned. A few minor procedures were undertaken along with culdoscopy in this series, as dilatation and curettage 8, with tubal insufflation 2. One case was followed by exploratory laparotomy.

Patency test was done in 2 cases and was satisfactory in one. One case was thought to be unsuitable on the examination table, as the patient did not allow the examination previously and a small buttonlike cervix and uterus were palpable. The difficulty of stabilizing the cervix was thought of in this case. The puncture site was sutured thrice in this series. The first case was sutured as a precautionary measure. The other two had to be sutured because of bleeding from the puncture site. Routine suturing of the puncture site was not found necessary in cases under study.

It must be admitted that in spite of all aspectic precautions, rigid asepsis is not possible in this potentially contaminated field. In addition, this being a teaching institution, several examiners participated in viewing the culdoscopic appearances. The surgeon's partially masked face approximates the sterile gloves and autoclaved instruments. In early cases, the procedure used to take a long time due to lack of practice of introduction and adjustment of the instrument. For these reasons antibiotics were administered to each patient for 2 days.

This procedure on an average took 22.5 minutes the minimum time being 10 minutes and maximum 40 minutes. The average period of hospitalization in this series was 40.1 Hours. (Min. 8 Hours, max. 144 hours). Billingsley discharged 84% of his



cases by the third day. In judging the results of the procedure, the following criteria were used:

1. The procedure was termed satisfactory if the visualization for the specified purpose was achieved adequately.

2. The result was interpreted as unsatisfactory when the examination for the specified purpose could not be carried out.

3. The procedure was deemed a failure if perforation of the pouch of Douglas could not be achieved.

4. In this study, the discomfort normally following a procedure is termed as side-effect e.g. abdominal discomfort and shoulder pains are inevitable after pneumoperitoneum of any origin. Peritonitis and rectal perforations must be labelled as complications.

The procedure was satisfactory in 21 cases, of which definite pathology was noted in 13 and pathology ruled out in 8 cases. The results were unsatisfactory in 2 cases; there was failure to penetrate in one case and selection was faulty in one.

Only a few cases have been cited below to show how culdoscopy helped.

#### CASE 3: (Q11019/1963)

Mrs. M. K., 20 years old, attended the out-patient department for 'primary sterility' (married 6 year back) and irregular scanty periods for 4 years. She gave a history suggestive of tubercular lymphadenitis 8 years ago. This asthenic patient had scars of healed lymphadenitis in the neck.

A thorough examination did not reveal any cause to account for primary sterility except thickening in both vaginal fornices. Investigations like total and differential count, erythrocytic sedimentation rate and

screening of chest did not throw light on possible existence of tubercular pathology. A thorough premenstrual curettage showed no evidence of endometrial tuberculosis. Other investigations for sterility including patency test and husband's semen were within normal limits. Suspicion of pelvic tuberculosis could not be ruled out. Culdoscopy was undertaken on 24-6-63 which revealed adhesions between the right ovary and a loop of small intestine. The tube and the uterus appeared normal. There was no evidence of pelvic tuberculosis on culdoscopy, and the case was further treated as non-specific chronic pelvic infection. (Fig. 4).

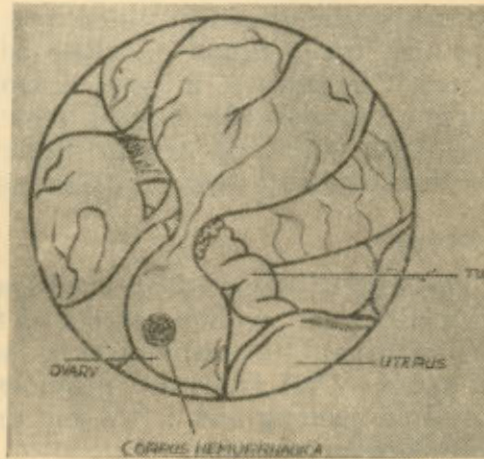


Fig. 4

#### CASE 12: (Q16626/1963).

Mrs. L. G., 30 years old, presented to us as a case of secondary amenorrhoea of 4 months' duration, following the last delivery and puerperal sterilisation 2 years ago. She did not breast-feed the child. Culdoscopy was done on her as a curiosity to visualize the post-sterilization appearance of the tubes, and any other associated pathology if present. Culdoscopy revealed a deficient portion of the tubes on either side—very characteristic of Pomeroy's method of sterilization. Except for a few adhesions, the pelvic organs appeared normal. (Fig. 5).





Fig. 5

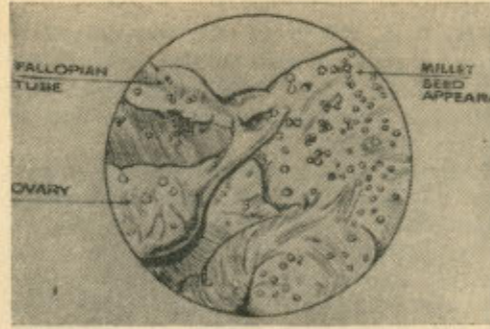


Fig. 6

**CASE 14: (17114/1963).**

Mrs. P. V., 22 years old, attended the out-patient department as a case of primary sterility (married 9 years back) and secondary amenorrhoea of 2 years' duration. Past history was not contributory. Bimanual examination revealed an anteverted, anteflexed normal-sized uterus and both fornices were thickened. There was a small erosion of cervix on speculum examination. Routine laboratory investigations for systemic or pulmonary tuberculosis were negative. A culdoscopy and a dilatation and curettage were undertaken on 30-9-63. Multiple bands of adhesions were seen on posterior surface of the uterus and the pouch of Douglas. The right ovary and the tube were studded with millet-seed bodies. Peritoneum of lateral wall also showed tubercles. Endometrial biopsy report at a later date read as tubercular endometritis. (Fig. 6).

Endometrial biopsy is diagnostic in 40-50% cases of pelvic tuberculosis. Culdoscopy will be of use in diagnosing the majority of remaining cases of pelvic tuberculosis.

**CASE 15: (Q18428/1963).**

Mrs. K. B., 30 years old, attended the out-patient department as a case of chronic pelvic pain (of 3 years' duration) and primary sterility (married 6 years back). She received antibiotics and S. W. D. as a treatment for her pain which was diagnosed to be due to chronic pelvic infection. She re-

ceived anti-amoebic line of treatment also in the past for dysentery. The patient gave a history of appendicectomy for chronic appendicitis 3 years ago and excision and ligation of bleeding piles later.

Vaginal examination revealed a normal sized retroverted uterus with restricted mobility and thickened fornices on both the sides. Laboratory investigations were not relevant. Culdoscopy was done on 22-10-63 which showed both the tubes and ovaries fixed to the posterior surface of the uterus, multiple fibrinous adhesions between the tubes and the ovaries. Parametrium and the pelvic peritoneum were markedly congested. The case was diagnosed as chronic salpingo-oophoritis and possibility of associated endometriosis could not be ruled out. (Fig. 7). Exploratory laparotomy was

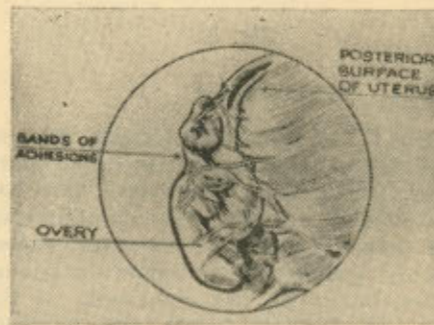


Fig. 7

decided at a later date, but the patient did not attend.



**CASE 20: (Q22089/1963).**

Mrs. S. S., 18 years old, complained of irregular profuse and painful periods for last 3 years (M.H. 4-6/15-60). She was married 3 years ago and was a case of primary sterility.

Bimanual examination revealed a normal sized mobile retroverted uterus and a cystic tender mass in the left fornix, in relation to the uterus or ovary; right ovary was palpable and normal. Investigations like full blood count, E.S.R., and screening chest did not reveal the nature of pathology. Culdoscopy and dilatation and curettage were undertaken on 13-12-63 which showed a normal posterior surface of the uterus and a normal right ovary and tube. On the left side there was an ovarian cyst about 3-4" in diameter and the fallopian tube was stretched over the ovarian cyst (Fig. 8). This case was called for follow-up with a view to exploratory operation, but failed to attend.

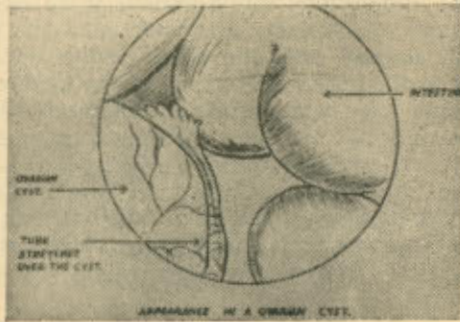


Fig. 8

**CASE 21: (Q22244/1963).**

Mrs. S. B., 26 years old attended the out-patient Department as a case of primary sterility. (married 15 years ago). She had scanty regular periods. Bimanual examination revealed a normal sized anteverted uterus and a multinodular lemon sized mass in connection with the right side of the uterus. In the left fornix was a cystic tender mass of lemon size. Clinical impression: multiple fibroid seedlings. Culdoscopy was done on 16-12-63. It showed a right polycystic ovary with the tube curled around it. On the left side there was a

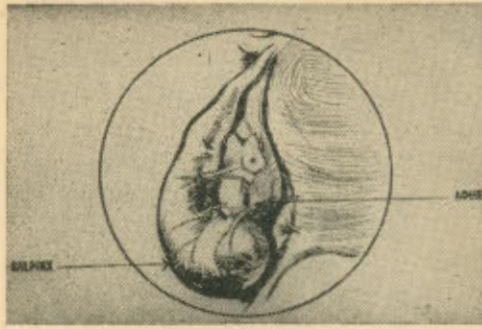


Fig. 9

hydrosalpinx with a blocked fimbrial end and a normal looking ovary adherent to it. Hysterosalpingography at a later date confirmed the findings and the case was treated accordingly. (Figs. 9 & 10).

**CASE 24: (19182/64).**

Mrs. S. S., 20 years old, presented to us with irregular profuse periods for last 2 years and had features of hirsutism, appearing gradually over a period of 2 years. Her menarche was at the age of 13 years



Fig. 10

and since then she did not have menstrual complaints. Examination revealed a hairy growth on the upper lip and the sides of the cheeks. Pubic hair was masculine in type. Bimanual examination revealed a normal sized ante-verted uterus (even under anaesthesia) and a cystic palpable ovary on the right side. left ovary was



just palpable. No renal lump was palpable. Endometrial biopsy could not be done as no endometrium could be obtained. Vaginal smears were eutrophic. Urinary 17-Ketosteroids MP 7.4 mg. OM. 12.15 mg. Basal body temperature charts showed absence of ovulation. Stein-Leventhal Syndrome was suspected even though both ovaries were clinically not enlarged significantly. Culdoscopy done on 17-7-64 showed bilateral polycystic enlarged oyster coloured ovaries, and a laparotomy followed. Ovaries were enlarged to about 3" x 3" size; thickened albuginia did not reveal any evidence of ovulation (Fig. 11). Wedge

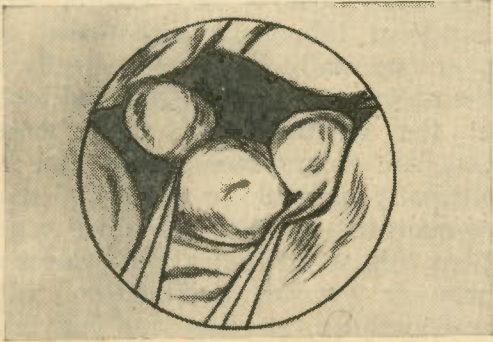


Fig. 11

resection and extrovers'ion of the ovaries was done. Histopathology confirmed the suspected diagnosis. The patient is being followed up.

### Discussion

Culdoscopy may be indicated in the following problems as an aid to accurate diagnosis:

1. Atypical ectopic pregnancy.
2. Tubal study, sterility, endometriosis, tuberculosis, adhesions.
3. Pelvic endometriosis.
4. Pelvic lump.
5. Idiopathic pelvic pain.
6. Minor operative procedures.

### 7. Research assistance value in ovum transfer study.

Intact hymen, narrow introitus, fixed retroversion, vaginal infections, fixed mass in the pouch of Douglas and decompensated heart disease which does not allow knee-chest position even for a few minutes, form contraindications.

### Ectopic gestation

Culdoscopy is not advisable in a definite case of acute ectopic with signs of shock and internal haemorrhage. It is useful in atypical cases which are likely to be tubal abortions or intact gestational sac. Cases suspected of ectopic gestation and not supported by positive evidence of colpopuncture form a specific indication for this procedure. Intact ectopic mass high up which is not easily reached by bimanual examination will have a reasonable chance of diagnosis.

Most authorities agree that the best time to treat an ectopic pregnancy is before rupture since significant morbidity and mortality are associated with rupture of the tube (Riva). Once the diagnosis of ectopic has been considered, immediate culdoscopy offers the safest and the most certain means available for confirmation. Riva did culdoscopy in 93 out of 132 cases between 1952 and 1957, and the procedure had 96% accuracy. Culdoscopic evidence of ectopic pregnancy may be either blood clots or streaks of blood in the peritoneal cavity or a ruptured sac with fibrinous clots or to distinguish between the bluish cystic mass of corpus leuteum or of follicle heamatoma and



the mass of tubal pregnancy. Often this differentiation can, however, be made by using the culdoscope so that unnecessary surgery may be avoided or necessary operation expediated.

Green, in his elaborate article, stresses the importance of 'High index of suspicion' regarding the diagnosis of ectopic gestation. He says that all the normal intrauterine pregnancies proceed uneventfully to term following culdoscopy, so that there is apparently no reason to fear that the culdoscopy by itself, under local anaesthesia will have any deleterious effect on an early pregnancy. In this era of antibiotics, the possible existence of acute salpingitis ceases to be a contraindication. Culdoscopy, thus is definitely a better alternative to the procedure of careful observation, in some cases amounting to neglect.

#### *Sterility*

In sterility, the selection of cases is important. There should be a suspicion of tubal pathology like blocked or tubercular tubes or sterility of obscure origin, prior to hasty 'open and see' decision to subject the patient to laparotomy.

In cases of sterility, culdoscopic findings like periovarian adhesions, small agglutinated fimbriae, tubal adhesions, osteal stenosis will guide us regarding both diagnosis and management. In cases where tubes are found to be blocked and hysterosalpingogram shows block at the cornual end, it is very essential and advantageous to know the exact anatomical condition of the tube before undertaking any surgery. Siegler performed 8 culdoscopic examina-

tions as a preoperative investigation in tubal plastic procedures. Findings in 2 cases were confirmed on exploration, in 3 cases the findings were partly confirmed and in the remaining cases the procedure was unsuccessful. He makes no mention of the cause of the failures. One wonders whether there was an element of pelvic infection and adhesions in these cases.

Incidental findings like endometriosis in cases associated with dysmenorrhoea, or early ectopic pregnancy or tubercular millet-seed appearance really guide us in clarifying the obscure clinical picture and assist in the treatment of these cases. Ovarian enlargements may not be clinically palpable in obese and non-co-operative patients Decker mentions this as an indication. Cases of primary ovarian dysfunction, with amenorrhoea, sterility and big bilateral polycystic glistened ovaries, have a good prognosis with wedge resection. These are the cases of 'Stein-Leventhal Syndrome' and can be confirmed on culdoscopy.

Taw obtained ovarian biopsy after posterior colpotomy in 62 cases of suspected Stein-Leventhal Syndrome. This can be done through the operative accessory of the culdoscope.

Taymor, in 1935, Stein and Leventhal described 7 patients with secondary amenorrhoea, hirsutism and sterility, in whom normal menstruation and fertility were restored by bilateral ovarian wedge resection.

Tubal patency may be tested by injecting methylene blue in saline through a cervical cannula and following up the tube with endoscope and observing the spill through fim-



brial ends of the tubes. It was tried in two cases in this series and the fimbrial ends visualized in one of the two. This method, however, has always been blamed as a mechanical patency method. It is also blamed because it does not indicate the functional activity of tubal epithelium. Decker places a small quantity of powdered starch granules in the cul-de-sac at the time of culdoscopy and a specimen of the cervical mucus is obtained 24 hours later and stained with iodine solution; here, blue colouration demonstrates normal tubal pick up.

#### *Pelvic Endometriosis*

Suspected cases of endometriosis may be subjected to culdoscopy. Endometriosis may also be a coincidental finding at such examination. According to Jeffcoate — "Whenever a disturbance which is labelled 'functional uterine bleeding' fails to respond to treatment or to cure itself in reasonable time, the diagnosis becomes suspect. In such cases subsequent events repeatedly show the presence of previously unsuspected disease such as pelvic adhesions, endometriosis or adenomyosis. Culdoscopy can exclude some of these."

#### *Diagnosis of a pelvic lump*

A pelvic lump is often a diagnostic dilemma. Laparotomy in such cases is the usual resort followed by many, but adds little to the clinical accumen of the gyneacologist. This cannot be too strongly stressed. Culdoscopy is definitely the halfway house between the elusive lump and the operation table.

#### *Research assistance value*

The mechanism of transfer of ovum from ovary to the fimbrial end of the tube is intricate and it has become easier to conduct the study since the advent of culdoscopy. During ovulatory period ovarian ligaments are seen to contract, thus bringing the ovaries nearer to the posterior surface of the uterus and the tubal fimbriae. In this series, this study was not attempted.

Cases of post-menopausal bleeding, where cytological smears are suggestive of malignancy, endometrial and cervical biopsy fails to ascertain malignancy; culdoscopy may help in making a possible diagnosis of cancer of ovary or tubes.

#### *Operating Culdoscopy*

Clyman's Panculdoscope has many advantages, one of them being that surgery can also be performed with it. Biopsy can be taken from the ovary or the endometrial implants or nodules from the pelvic cavity. Fluid from the follicular cyst can be aspirated and studied. Adhesions can be broken down, haemostasis being achieved with electrocautery.

#### *Idiopathic pelvic pain.*

Patients with chronic pelvic pain without any palpable pathology have been treated as pain of psycho-somatic origin. The number of such supposed psycho-somatic cases may be reduced by subjecting them to culdoscopic examination.

#### *Summary & Conclusions*

1. The result of culdoscopic findings in the present series of 25 cases



are presented in the light of more extensive studies by foreign authors.

2. The relevant literature on culdoscopy has been reviewed.

3. The primary aim of this study was to evaluate the status of culdoscopy as an useful method of investigation. This study is small, yet these claims seem to be fulfilled.

4. The procedure is technically simple. The side effects and complications are minor and infrequent. Contraindications are few and even these are prone to diminish with increasing experience.

5. Local anaesthesia is satisfactory in the majority of the cases.

6. Culdoscopy has a definite value in bridging the gap between the conservative and aggressive management of the patient with primary subjective manifestations.

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