

## GYNAECOGRAPHY

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The introduction of gynaecography or pelvic pneumography (Stein, 1926) i.e. the injection of gas in the peritoneal cavity and visualising the pelvic contents, has proved to be of great usefulness in gynaecological diagnosis. By this the normal uterus, tubes and ovaries can be clearly visualised on the roentgen films and often exploratory surgery in cases of suspected lesions can be avoided by obtaining such a film. In addition, any gross changes such as alteration in size, shape and density of these viscera such as one observes in uterine myomas, ovarian cysts and tumor, tubal enlargement and adhesions of the pelvic viscera to omentum or to the intestine can be seen by gynaecography. This type of gynaecography utilizing only gas is referred to as the "Single contrast" or "Simple gynaecography".

Majority of the workers have used abdominal route for pelvic pneumography but others have used transuterine method for the same, or some times in combination with hysterosalpingogram to visualize the uterotubal cavities as well. Dicker (1946) described pervaginal

method of pneumoperitoneum by perforation of the posterior vaginal fornix with a trochar, keeping patients in knee chest position.

Transabdominal route is the method of choice in most of the cases due to following reasons:

1. It is generally easier and quicker.
2. It is more comfortable for the patient.
3. Little experience is required to obtain diagnostic films.
4. It can be used even in cases of bleeding pervaginum, absent vagina or uterus and cervical stenosis, in which other routes can not be used.

The present study is under taken to assess the value of pelvic pneumography as diagnostic aid in various lesions of pelvis and its correlation with clinical and operative findings.

### *Material and Methods*

The present study "The Pelvic Pneumography" was carried out in the Department of Radiology, and J.K. Cancer Institute from December 1975 to March 1976. The cases were selected from Outdoor Section and Indoor Section of J.K. Cancer Institute and Department of Obstetrics and Gynaecology of G.S.V.M. Medical College, Kanpur.

After thorough general systemic and

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pervaginal examination in suitable cases gynaecography was done. The procedure is similar to that described by various authors (Buice and Gould, 1957; Schults and Rosen, 1961; Saxton and Strickland, 1964; Kendall, 1967). The patient is instructed not to take any thing by mouth for about 4 hours and a cleansing enema is given about one to two hours before the procedure. An hour before the test 100 mg of pethidine is administered intramuscularly. She lies supine on a tilting X-ray table that has a shoulder rest attachment. After infiltrating small area lateral to the left rectus muscle about three and a half centimeters below the umbilicus with local anaesthetic a fine lumbar puncture needle with styllete is introduced into the peritoneal cavity. The abdominal wall is made tense by voluntary raising the head. The needle is connected via a three way tap to a source of gas and a 50 cc syringe. Air was used as gas. The table is slightly tilted and 1000 to 1500 cc of gas is injected.

The patient is turned to the prone position. The table tilt is increased to 40 degrees head down so that the gas ascends to the pelvis and the intestine fall away from the pelvic cavity. The central rays enter 3 to 5 cm. below the tip of the sacrum. The film is placed in the Bucky tray. The tube to film distance is kept at 40 inches. A soft tissue exposure is given. The film is developed immediately and viewed. If the tubo-ovarian outline is not clear or if they are placed too close to the pelvic wall, repeat exposures are made with slight pelvic tilt.

After the procedure, the table tilt is reduced to about 30 degrees and the patient is turned to the supine position. The patient is returned to the ward and instructed not to sit up for about two hours.

If there is much discomfort the foot end of the bed is raised.

#### Observations

In present study pelvic pneumography was done in 84 cases by transabdominal route.

Cases have been arranged in seven groups:

1. Normal control	16
2. Carcinoma cervix	14
3. Fibroid uterus	18
4. Ovarian masses	12
5. Chronic pelvic inflammatory disease	6
6. Stein leventhal syndrome	4
7. Developmental defects	10

#### Discussion and Interpretation of Gynaecograms

##### Control Group

In normal cases the uterus is seen as a biconvex shadow. The fallopian tubes round ligaments and ovaries are seen on either side. The parametrium appears as fine lines splitting laterally to form a triangle with the pelvic wall. The urinary bladder is seen flattened out behind the pubic bones, when it is empty or as a convex bulge when it contains some urine. The sigmoid colon is seen posteriorly close to the sacrum. Ovariouterine ratio ranged between 0.24 to 0.28. According to Stein (1949) normal ovariouterine ratio was about 0.25.

##### Carcinoma Cervix

All the 15 proved cases of carcinoma cervix of Stage I, II, III and IV were subjected to pneumography. Only cases of Stage I were subjected to laparotomy.

Interpretation of pneumographic staging was done on the following consideration. The free edges of broad ligaments



appear paper thin and the soft tissue of normal lateral pelvic walls constitutes a smooth density tapering anteriorly and posteriorly and measuring 0.5 cm at the thickest point. Smoothness is more important than thickness since an obese patient may have upto 2 cm of normal tissue thickness. A study showing normal appearance or cervical enlargement indicate stage I, study which shows thickening of broad ligament on either side, but all the way to the pelvic wall indicate Stage II, nodular thickening extending to and or involving the broad ligament upto the pelvic wall Stage III and filling of anterior or posterior recesses extension to bladder or rectum Stage IV carcinoma of cervix.

In present series pelvic pneumographic and clinical correlation was found in 10 of 14 cases, pelvic pneumographic and surgical correlation was found in one. Common gynaecographic error was over staging. We found that the pelvic pneumographic appearances of carcinoma cervix II and III and that of pelvic inflammatory disease are similar so if they are co-existent, over staging will occur and carcinoma can not be excluded without biopsy. Sala Jose *et al* (1962), Dave *et al* (1964) also did pelvic pneumography in cases of carcinoma of cervix. They also reported that common pneumographic error was over staging.

#### *Fibroid Uterus*

In our series diagnosis of fibroid uterus of 14 cases out of 18 could be made after reading the pelvic pneumogram. In other 4 cases the clinical diagnosis of the fibroid uterus was proved to be incorrect by pelvic pneumography. Diagnosis of fibroid was made by characteristic lobulated enlargement of uterine shadow. Dave *et al* (1964) also reported that in 96% cases fibroid uterus was easily diag-

nosed by lobulated enlargement of uterine shadow.

#### *Ovarian Masses*

In present study, 12 suspected cases of ovarian masses were also diagnosed by us with the help of pelvic pneumography. Clinical and pneumographic efficiency was 100% whereas pneumographic and surgical efficiency was 83%. Of these cases, 2 cases refused operation. Dave *et al* (1964) reported 55% clinical efficiency and 74% pneumographic success as compared to 100% pneumographic success in our series.

#### *Chronic Pelvic Inflammatory Disease*

In cases of chronic pelvic inflammatory diseases, gynaecograms showed that parametrium invariably becomes thickened and the fine parametrial triangle will no longer be visible. Bands of adhesions between the uterus, ovaries and sigmoid colon may be visible. In our series on the basis of clinical and pneumographic findings, 6 cases of pelvic inflammatory disease were diagnosed. Pneumography is helpful in diagnosing pelvic inflammatory disease and the diagnosis on clinical examination is difficult.

#### *Stein Leventhal Syndrome*

In this study we had 4 cases of suspected Stein Leventhal syndrome who were subjected to pelvic pneumography. Clinically, ovaries were palpable bilaterally in 2 cases and only unilaterally in remaining 2 cases. Pneumogram revealed enlargement of ovaries in all 4 cases. The ovariouterine ratio was more than 0.5 in 3 cases and 0.5 in the fourth case. Edwards and Evans (1963) had shown enlargement of ovaries in 18 cases by pelvic pneumography. Weigen and Stevens (1967) found that ovariouterine ratio of 0.5 or more



is suggestive of polycystic disease of ovaries.

#### Developmental Defects

Under this group we had 10 cases, 6 had primary amenorrhoea and 4 had irregular vaginal bleeding. The pelvic pneumographic findings were as follows:

Absent uterus with small ovaries, very small uterus with absent ovaries, very small uterus with hypoplastic ovaries, very small uterus with small ovaries. Lippe *et al* (1975) did pelvic pneumography in children as well as adults and concluded that pelvic pneumography is most valuable diagnostic procedure for the evaluation of sexual disorders of childhood and adolescence.

#### Failure and Complications

In our study 6 cases had moderate pain in abdomen, 6 had pain in shoulder and 2 had nausea. In one case of ovarian cyst the needle accidentally went into ovarian cyst and fluid came out. No other complication was recorded in our series.

#### Conclusion

1. Gynaecography by transabdominal route is safe and had minimal complications in carefully selected cases. The apparatus and equipment is simple and inexpensive.

2. Pelvic pneumography can unearth pelvic inflammatory disease in many unsuspected cases but pneumographic distinction between tumor extension from carcinoma cervix, and chronic pelvic inflammation is not possible.

3. It is invaluable diagnostic procedure for the diagnosis of congenital and acquired defects of the uterus and ovaries which may be missed on clinical examination specially in obese and unco-operative patients.

4. The method should not be used in cases of acute pelvic inflammation, peritonitis, ascitis, very old patients, patients with poor surgical risks, shock, in cases of cardiopulmonary decompensation e.g. heart failure which renders the trendelenberg position impossible, and in patients with large tumor mass filling the whole pelvis.

#### References

1. Buice, J. W. and Gould, D. M.: *Radiology*. 69: 704, 1957.
2. Daves, M. L., Dinner, W. C. and George, H., Brenner: *Am. J. Roentgenology*. Vol. 92 No. 2, 390-399, 1964.
3. Decker, A.: *New York, J. Med.* 314: 46, 1946.
4. Kendall, B. F. F. R.: *Radiology*. 33: 3, 1967.
5. Lippe, B. M., Gyepes, M. T. and Kaplan, S. A.: *Am. J. Roent. Rad. Therapy & Nucl. Med.* Vol. 123: No. 4, 829, 1975.
6. Sala, Jose, M. Keats, Theodore, E. Dolan and Kenneth, D.: *Radiology*. 78: 274, 1962.
7. Schulz, E. and Rosen, S. W.: *Am. J. Roentgenol. Rad. Ther. & Nuclear Med.* 86: 866, 1961.
8. Stein, I. F.: *Radiology*. 28: 391, 1926.
9. Stein, I. F. and Cohen, M. R. and Elson, B.: *Am. J. Obst. & Gynec.* 58: 267, 1949.
10. Weigen, J. F. and G. Milvin Stevens: *Am. J. Roentgenology*. Vol. 100: No. 3, 680, 1967.

See Figs. on Art Paper II-III