

Efficacy of Fine Needle Aspiration (FNA) Cytology in Differentiating Malignant and Benign Ovarian Cysts

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This study was carried out to determine the diagnostic efficacy of fine needle aspiration cytology between neoplastic and non neoplastic ovarian cysts and to verify the cytological diagnosis of aspirated fluid with histology of excised cyst. This was carried out at the Department of Obstetrics & Gynaecology, Ghurki Trust Teaching Hospital, Lahore from February 2003 to February 2005. It was an analytic study. A total number of 55 patients were included in the study. They were selected on the basis of ultrasonographic examination and having unilocular and non septate ovarian cysts. Ultrasound guided aspiration of cysts was done followed by excision. The cytology of fluid was correlated with histology of excised cyst. **Results:** Follicular cysts were seen in the highest percentage followed by haemorrhagic luteal cysts, serous cyst adenomas and serous cyst adenocarcinomas. **Conclusion:** Ultrasound guided fine needle aspiration of ovarian cysts is a feasible alternative to surgery for benign cysts of the ovary.

Key words: Fine needle aspiration, ovarian cyst, benign & malignant

Cystic lesions in the ovary are frequently encountered in routine gynecological practice. Those of surgical importance are either neoplastic cysts or hormone dependant functional cysts. Neoplastic Cysts can be of a wide variety of histological types whereas functional cysts are usually transient in nature.

The distinction between benign and malignant ovarian cysts is important for the proper management of the patients.

Ultrasonographic features discriminating benign and malignant cysts of the ovary have been well defined¹. Features suggestive of malignancy include multiloculation, presence of septa, presence of solid foci in the wall of the cysts and the fluid in the cyst may be haemorrhagic².

Benign lesions are usually unilocular, non septate and thin walled. They usually contain clear fluid³.

Despite these well laid down criteria, the sensitivity and specificity of ultrasonography for discriminating benign from malignant cysts has often been questioned.

The management of ovarian cystic lesions therefore is conventionally centered on surgical excision followed by histological differentiation between various types of cysts. Lately ultrasound guided aspiration of ovarian cysts has been shown to be a satisfactory alternative to surgery. For most patients it is a simple outpatient procedure with a high degree of patient acceptance.

A transvaginal ultrasound obtaining optimal views is preferred to linear array transducer in order to prevent aspiration of ectopic pregnancies⁴. The procedure is well accepted even in pregnant females. Here it is specially recommended for cysts between 5-10 cm in diameter⁵.

Aims & Objectives:

1. To assess the diagnostic efficacy of fine needle aspiration cytology in differentiating between neoplastic and non neoplastic/ functional ovarian cysts.

2. To verify the cytological diagnosis of aspirated fluid with the histology of excised cyst.
3. To evaluate the diagnostic yield of intracystic estradiol level estimation as a complementary diagnostic technique in work up of ovarian cystic lesions.

Materials & Methods

The present study includes 55 cases. These were selected from Department of Obstetrics & Gynaecology of Ghurki Trust Teaching Hospital, from February 2003 to February 2005.

Patient Selection:

The cases were selected on the basis of ultrasonographic (USG) examination revealing ovarian cystic lesion which are unilocular and non septate.

Exclusion Criteria:

Cases of ovarian cysts with ultrasonographic evidence of septation or presence of solid areas in the cyst wall were excluded from this study.

Procedure:

In all the patients transabdominal/ transvaginal ultrasound directed aspiration was done and the aspirate was sent for processing immediately.

Handling of Aspirated Material:

The aspirated material was centrifuged at a speed of 4000 revolutions/ min, using centrifuge machine. The deposits were smeared over clean glass slides and minimum of 4 smears were prepared. Following stains were employed.

1. May - Grunwald Gicmsa on air dried smear - minimum of 2 slides
2. Papinicolon stain on alcohol fixed smears - minimum of 2 slides
3. Hematoxylin & eosin stain - if more smears were available

Histological Examination:

Histological examination of the surgically excised cysts was carried out. The surgery was carried out on previously

aspirated cysts. Depending on the cyst size, one block/ every cm of the cyst wall was taken. Routine paraffin blocks were prepared and histological examination was carried out on 3-5 μ m thick sections.

Stains. H & E Stain. (Haematoxylin & Eosin Stains)

Results:

Total No. of patients: n = 55

Histopathology	=n	%age
Follicular cysts	35	63.63
Haemorrhagic luteal cysts	13	23.63
Serous cyst adenomas	3	5.45
Serous cyst adenocarcinoma	3	5.45
Others	1	1.82

Follicular cysts (n=35) showed serum estradiol levels of > 20 nmol/ Lt.

Discussion:

During reproductive age the commonest cystic lesions are follicular or luteal in origin. The serous and mucous cysts constitute the next important category of cystic lesions. Several reports have appeared in literature describing the management of ovarian cyst in pregnancy by ultrasound directed aspiration.⁶ Nicholas and Mulvany, carried out ultrasound directed aspiration of ovarian cysts. They analyzed 235 aspirates describing a full range of cytological findings in cases of functional and neoplastic cysts. The desquamated granulosa cells could be identified in the aspirate easily in cases of functional cysts.

However, several pitfalls for cytological diagnosis were reported.⁷ The aspirates from functional cysts may contain pleomorphic hyperchromatic cells accounting for false positive diagnosis of malignancy. Another problematic zone is acellular nature of the aspirate. Still another pitfall is the considerable morphological overlap between the epithelial cells from serous cyst adenomas, parovarian cysts, paratubal cysts and cortical inclusion cysts.⁸ Such pitfalls result in low sensitivity and specificity for discriminating between various types of cysts on the basis of cytology alone. The limitations of cytology for diagnostic purposes is highlighted in several studies.⁹ This can however, be overcome by carrying out hormonal assay of intracystic fluid concomitantly.¹⁰

The diagnostic value of estradiol (E₂) assay in ovarian cystic fluid has been emphasized by many workers¹¹. This naturally occurring estrogen is produced by the granulosa cells of ovarian follicles. Intra follicular level is much higher than the plasma levels. Peak levels are encountered with maximum granulosa cell proliferation. Later condition can lead to sufficient nuclear atypia and high mitotic activity thus leading to false positive cytological diagnosis of malignancy. However, a high estradiol (E₂) level contradicts this diagnosis. A cut off safe limit of > 20 nmol/ L of E₂ in the intracystic fluid is taken as an indicator of follicular cyst with a high degree

of specificity.¹¹ Several studies have evaluated the diagnostic efficacy of combined cytology and E₂ level estimation in ovarian cystic lesions. The diagnostic value of E₂ level estimation is further emphasized in case where the cell yield in the aspirate fluid is inadequate for a definite cytological diagnosis.

Mulvany, Oster, Teng, in their study, reported a sensitivity of as low as 52% for diagnosis of follicular cysts by fine needle aspiration alone which increased however to 96% with concomitant estradiol assay¹².

The three parameter scheme of sonography, aspiration cytology and hormonal assay offers the best diagnostic approach towards handling the ovarian cystic lesions.

Ultrasound directed fine needle aspiration is essentially an out patient procedure. If carried out in carefully selected cases of ovarian cysts, it can substantially reduce the incidence of hospitalization and rate of superfluous surgery in case of simple ovarian cystic lesions. Considering the socio-economic condition of our general population and the burden, adoption of such a diagnostic modality in routine gynecological practice should be encouraged. The present study, therefore, evaluated the diagnostic utility of ultrasound guided FNA of ovarian cystic lesions. The sensitivity and specificity of the procedure was established by doing a cytohistological correlation in order to assess the usefulness of procedure as an alternative to surgery for diagnostic purpose. Intracystic E₂ levels were also estimated in the non diagnostic hypocellular aspirates.

A careful follow up is essential as recurrence of cyst due to further fluid accumulation is expected in large sized cysts. The utility of this procedure as a diagnostic means to predict the nature of cyst has also been promoted in several studies⁶.

Conclusion

The study data supports the conclusion that ultrasound guided fine needle aspiration of ovarian cysts is a feasible alternative to surgery for benign cysts of the ovary. It also aids in reducing morbidity associated with surgical procedures.

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