A COMPARISON BETWEEN ASPIRATION CYTOLOGY AND HISTOLOGICAL FINDINGS OF OVARIAN MASSES

M. Djamali-Zavarehi, S. Sarmadi and F. Azmoudeh Ardalan

Department of Pathology, Imam Khomeini Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Abstract - Fine - needle aspiration (FNA) cytology of ovary is a simple method for evaluation of ovarian masses. But there is controversy about its reliability in differentiating between benign and malignant neoplasms. To evaluate the efficacy of FNA cytology in the distinction between benign and malignant masses of ovary, we examined 55 fine needle aspirations from 55 women 14-74 years of age. The aspirations were performed on fresh resected ovarian masses, which were sent to the pathology department for intraoperative consultation. All smears were Papanicolaou-stained and studied in two stages. In the first stage the smears were studied without any clinical and gross pathologic information and in the second stage clinical and gross pathologic information was available. In the first stage the results were classified as benign, malignant and inconclusive. In the second stage there was no inconclusive case so the results were divided into benign and malignant. By comparing the cytologic results with histologic diagnoses (gold standard), the sensitivity and specifity of FNA cytology was determined in the two stages. In the first stage, 11 cases were considered inconclusive and the sensitivity and specifity of the method was 87.5% and 83.3%, respectively. In the second stage the sensitivity and specifity was 78.7% and 92.7%, respectively with no inconclusive case.

We conclude that FNA cytology of ovary is a reliable method for distinction between benign and malignant ovarian masses.

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Key Words: Fine needle aspiration, ovary, cyst, and neoplasm

INTRODUCTION

Despite controversies, fine-needle aspiration (FNA) cytology of ovarian masses and cysts is a simple and reliable method for diagnosis of different lesions. FNA cytology of ovary is especially valuable in young females in whom the function of ovary is important (1,2). Even during pregnancy this method can be used safely for differentiating between functional cysts and benign lesions from malignant tumors. It is also a safe method for the evaluation of adnexal masses in the old women who are at high risk for surgical procedures (3). To evaluate the diagnostic efficacy of FNA cytology of ovarian masses, we decided to perform FNA cytology on fresh specimens sent to our department for intraoperative consultation. Pelvic masses can be aspirated using several different approaches: (1) through the wall of the vagina; (2) through the wall of the rectum; (3) transabdominally; and (4) during laparoscopy (8). In our hospital the clinicians do not routinely perform FNA of ovarian masses. So we performed the fine needle aspirations on the resected fresh ovarian masses.

MATERIALS AND METHODS

After delivery of a fresh resected ovarian mass to pathology department, its size was recorded. Then with a 22-gauge needle and a 10 ml syringe, different sites of the mass was aspirated. In cystic cases about 10 ml of fluid was collected. The fluid and particles were spread on 4 glass slides and immediately fixed by 95% ethanol. Clinical and gross pathologic information was collected in special forms. All the slides were Papanicolaou stained and studied in two different stages. In the first stage the smears were evaluated without any clinical and gross pathologic information. Based on the number of cellular sheets per low power field, characteristics of cellular sheets, characteristics of background epithelial cells and presence of tumor diathesis, the "primary cytologic impressions" were divided into three groups: benign, malignant and inconclusive. In the second stage the slides were re-evaluated but this time, clinical and gross pathologic findings were available. The "secondary cytologic diagnoses" were categorized as benign and malignant. The primary and secondary cytologic diagnoses were compared with histologic diagnoses as gold standard.

RESULTS

About 220 smears belonging to 55 women with ovarian masses, 14-74 years of age were evaluated in this study. The final histologic diagnoses consisted of 51 benign lesions and 14 malignant tumors (Table 1).

Table 1. Final histopathologic diagnoses

Final histologic diagnosis	No.	(%)
Serous cystadenoma	10	18
Mucinous cystadenoma	7	13.8
Hemorrhagic corpus luteal cyst	5	9
Follicular cyst	2	3.6
Simple cyst	2	3.6
Endometrioid cyst	5	9
Massive edema	1	2
Mature teratoma	1	2
Fibroma	1	2
Inflammatory process	1	2
Leiomyoma	1	2
Granulosa cell tumor	4	7
Germ cell tumor	5	9
Clear cell carcinoma	1	2
Serous cystadenocarcinoma	4	7
Borderline serous cystadenocarcinoma	1	2
Proliferating endometrioid cystadenocarcinoma	1	2
Endometrioid carcinaoma	1	2
Mucinous cystadenocarcinoma	1	2
Total	55	100

In the first stage, there were 11 inconclusive, 32 benign and 12 malignant primary cytologic diagnoses. After exclusion of the inconclusive case, the primary cytologic diagnoses were compared with final histologic diagnoses (Table 2).

Table 2. Comparison of primary cytologic diagnoses and final histologic diagnoses

	Benign	Malignant	Inconclusive	Total
Primary cytologic diagnosis	32	12	11	55
Final histologic diagnosis	41	14	-	55

Sensitivity = 83.3%
Specificity = 87.5%
Positive predictive value = 71.4%
Negative predictive value = 93.3%

In the second stage of the study there were no inconclusive cases; the results are summarized in Table 3.

We could not find any correlation between degree of cellularity and malignancy (P = 0.1). In our study, the most important marker for malignancy was cellular atypia.

Table 3. Comparison of secondary cytologic diagnoses and final histologic diagnoses

	Benign	Malignant	Total
Secondary histologic diagnosis	41	19	55
Final histologic diagnosis	41	14	55

Sensitivity = 78.6%
Specificity = 92.7%%
Positive predictive value = 78.6%
Negative predictive value = 92.7%

DISCUSSION

Literature review shows limited studies concerning the efficacy of FNA cytology for the evaluation of ovarian tumors and most of the studies have been performed on cystic lesions. In this study we evaluated the efficacy of FNA cytology in correct categorization of ovarian masses, both cystic and solid. In real practice, aspiration cytology can be performed through a laparoscope, transvaginally, transrectally, or transabdominally. Since we performed the aspirations on resected ovarian masses, there was no contamination with the "en route" structures and on the other hand in cases of scant cellularity we were almost sure that it was not due to technical errors; by having clinical and gross findings at hand we could divide cases into benign and malignant with relatively good results.

In the second stage of the study despite having clinical and gross findings at hand while interpreting the results, the sensitivity of the procedure was reduced a little. But the specificity was increased and the inconclusive cases were completely omitted. The reduced sensitivity in the second stage of the study was partly caused by the borderline (low malignant potential) cases, which contained scant cellularity while we were committed to classify them. Even in the histologic sections sometimes we had difficulty classifying some of the epithelial tumors as benign or low malignant potential. This study shows that clinical information such as age of the patient, menstrual status, imaging/ laparoscopic findings and serum tumor marker levels can be very valuable in correct diagnosis of ovarian fine needle aspirations.

Although having clinical/imaging/laparoscopic

findings at hand, most of the cases with scant cellularity can be categorized correctly, a few borderline epithelial tumors may be falsely categorized as benign, as mentioned previously. If avoidance of such a mistake is desirable, the cases of scant cellularity must be categorized as inconclusive or unsatisfactory (as has been proposed in other studies) but in this case a significant number of benign lesions will be categorized as inconclusive. So the importance of close communication between the pathologist and the clinician cannot be overemphasized.

Several studies from 1979 till 1999 showed a sensitivity of 30%-83% and a specificity of 90-100% (4-7). Although it was our first experience in the evaluation of ovarian FNA smears, our results were reasonably good (sensitivity of 83.3% and 78.6% and specificity of 87.5% and 92.7% in the first and second stages of our study, respectively).

We conclude that FNA is a simple and reliable method for evaluation of ovarian masses, both solid and cystic. It is especially valuable when accompanied by clinical and imaging/laparoscopic findings. So it seems reasonable to persuade the clinicians in our hospital to perform FNA on ovarian masses. This procedure can be performed transabdominally, transrectally, transvaginally, and during laparoscopy. And in the next study the efficacy of in-vivo ovarian FNA can be determined.

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REFERENCES

1. Selvaggi SM. . Cytology of nonneoplasic cysts of the ovary. Diagnostic Cytopathology. 6(2): 77-85; 1990.

2. Selvaggi SM. FNA cytology of cystic ovarian lesions. Diagnostic Cytopathology. 11(1): 9-14; 1994

3. Ganjei P, Nadji M. Aspiration cytology of ovarian neoplasms. A Review. 28(3): 329-332; 1984

4. Ramzy I, Delaney M. Fine needle aspiration of ovarian masses. I. Correlative cytologic and histologic study of celomic epithelial neoplasms. Acta Cytol. (6(2): 97-104; 1979

5. Ramzy I, Delaney M, Rose P. Fine needle aspiration of ovarian masses. II. Correlative cytologic and histologic study of nonneoplastic cysts and noncelomic epithelial neoplasms. Acta Cytol. 23(3): 185-93; 1979.

6. Ganjei P, Dickinson B, Harrison T, Nassiri M, Lu Y. Aspiration cytology of neoplastic and non-neoplastic ovarian cysts, is it accurate? Int. J. Gynecol. Pathol. 15(2): 94-101; 1996

7. Higgins RV, Matkins JF, Marroum MC. Comparison of fine-needle aspiration cytologic findings of ovarian cysts with ovarian histologic findings. Am. J. Obstet. Gynecol. 180(3): 550-553; 1999

8. Ganjei P. Fine needle aspiration cytology of the ovary. Gynecologic Pathology. 15(3): 705-726; 1995.