Int J Cancer Manag. 2018 February; 11(2):e8121. doi: 10.5812/ijcm.8121.

Published online 2017 October 29. **Research Article**

Is Transvaginal Core Needle Biopsy A Safe Method in Diagnosis of Ovarian Cancer?

Zohreh Yousefi,[1] Marjane Frazestanian,[2] Behroz Davachi,[3] Shohreh Saeed,[2,*] Afrooz Azad,[4] and Saeede Tavakoli Khorasani[5]

[1]Professor, Department of Obstetrics and Gynecology, Fellowship of Gynecology Oncology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Resident Fellowship of Gynecology Oncology, Department of Obstetrics and Gynecology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[3]Associate Professor, Department of Radiology Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[4]Resident, Department of Obstetrics and Gynecology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[5]The Nurse of Gynecology Oncology, Department of Obstetrics and Gynecology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

[*]*Corresponding author*: Shohreh Saeed, Resident Fellowship of Gynecology Oncology, Department of Obstetrics and Gynecology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. Tel: +98-5118012477, Fax: +98-5118430569, E-mail: sabalanmountain@yahoo.com

Received 2016 August 06; **Revised** 2016 October 02; **Accepted** 2017 October 03.

Abstract

Background: The optimal management of highly invasive ovarian cancer has changed from adjuvant chemotherapy after surgery to neoadjuvant chemotherapy followed by interval debulking surgery. Generally, tissue specimen for definitive diagnosis of ovarian malignancy is necessary. However, abdominal wall metastasis is a complication, known as transabdominal ascites aspiration or percutaneous core needle biopsy. When neoadjuvant chemotherapy is indicated, transvaginal core needle biopsy under sonographic guidance provided enough tissue specimens. In addition, resection of most of upper vaginal wall during surgery prevents needle site metastasis. The aim of this study is to evaluate transvaginal core needle biopsy as a safe method for diagnosis of ovarian cancer.
Methods: This clinical trial study was performed on patients who were candidate for neoadjuvant chemotherapy and were referred to gynecology oncology department of Ghaem Hospital, Mashhad University of Medical Sciences during 2014 to 2015.
Results: Twelve women with a presumptive diagnosis of stage III c or IV ovarian cancer were selected. Adequate sample was obtained by transvaginal core needle biopsy, and cancer diagnosis was confirmed in all cases. This procedure resulted in optimal debulking surgery in 2 /3 of cases.
Conclusions: Transvaginal core needle biopsy is a safe diagnostic method of ovarian cancer.

Keywords: Diagnosis, Ovarian Cancer, Transvaginal Core Needle Biopsy

1. Background

Cytoreductive surgery followed by chemotherapy has been the standard approach in all stages of ovarian cancer. It seems impossible to achieve optimal debulking in many cases of highly advanced stages of this disease (1). Few cycles of neoadjuvant chemotherapy and subsequent interval debulking surgery in new clinical trials are preferable optional management for these patients. This strategy led to fewer surgeries and possibility of more chance for optimal operation (2). Although it is necessary to obtain definite diagnosis of ovarian carcinoma, needle aspiration of malignant cells in ascetic fluid is an acceptable method, but tissue diagnosis is preferable. However, the risk of untreatable abdominal wall metastasis in both procedures is reported (3). In order to obtain acceptable accurate tissue biopsy and to avoid the dissemination of tumor in needle insertion site, transvaginal ultrasound-guided core needle biopsy appears to be a suitable method with low risk of iatrogenic intra-peritoneal dissemination (4). The transvaginal ultrasound-guided biopsy was first reported by Volpi et al. in 1991, performed on 18 suspected cases with ovarian cancer (5). Kitayama et al. obtained tissue biopsy under guided transvaginal ultrasonography in patients with frozen pelvis due to severe peritoneal adhesion of ovarian cancer. They were able to obtain accurate tissue diagnosis through transvaginal in almost half of the patients with advanced ovarian cancer (6). It seems that, in recent years, neoadjuvant chemotherapy followed by debulking surgery is a front-line opinion in treatment of advanced stage of ovarian cancer. Prior to commencing chemotherapy, tissue diagnosis is required. The aim of this study is to evaluate transvaginal core needle biopsy as a safe method for diagnosis of ovarian cancer.

2. Methods

This clinical trial study was performed on patients who were referred to gynecology oncology department of Ghaem Hospital, Mashhad University of Medical Sciences during 2014 to 2015. This study was approved by the ethics committee of Mashhad University of Medical Sciences.

The inclusion criteria included: 1, provisional clinical presentation of advanced stage of ovarian cancer (Stage III c stage IV); 2, features of ultrasound or CT- scan compatible with malignancy; 3, elevated CA - 125; 4, impossible optimal cytoreductive surgery without neoadjuvant chemotherapy; 5, not acceptable methods for sampling, such as peripheral lymphadenopathy, and 6, deep pelvic palpable tumor and safely accessible to sampling through recto vaginal examination. The evaluated variables included the complaint of patients, patients' age, performance Status, the character of masses on sonography, the level of tumor marker, the histology of tumor, the accuracy of tissue biopsy, and needle site metastases. An informed consent was obtained from each participant prior to study entrance. Initially, pain medication by 800 mg gelofen began for all patients. After recto vaginal examination, transvaginal sonography guided core needle biopsy in standard fashion was performed by a 16-gauge needle biopsy (Soja -Machi, Japan). The duration of biopsy procedure was about 10 minutes. During the first 2 hours of sampling, the monitoring of vital signs was performed every half hour and, then, every hour up to 4 hours; then, the patients were discharged. All patients underwent cytoreductive surgery after 3 to 6 courses of neoadjuvant chemotherapy. To reduce the risk of invasion in needle site, during surgery, we removed more upper vaginal walls.

3. Results

A total of 12 women with a presumptive diagnosis of stage III c or IV ovarian cancer entered to the study and were evaluated. The demographic characteristics of the patients are shown in Table 1; the mean age of the patients was 56.75 years. The average level of marker CA - 125 was 1837. Papillary serous carcinoma was reported in the majority of samples. Adequate sample was obtained by transvaginal core needle biopsy, and cancer diagnosis was confirmed in all cases, correlated with final pathology report after surgery. The best result was that 2/3 of patients (stage III c or IV) operated optimal debulking surgery.

There was no case of excessive hemorrhage or hemodynamic instability. There was mild discomfort during the procedure in all patients, which settled as soon as the procedure was completed, and no patients except 1 requested analgesic. In all patients with cancer diagnosis at first biopsy, the pathology was consistent with the pathology obtained after surgery.

4. Discussion

According to the results of this study, transvaginal core needle biopsy under the guide of sonography was a suitable approach in the diagnosis of advanced ovarian cancer suspected non-optimal surgery, and 100% success rate without serious complication was found. In a study conducted by Volpi et al., one false-negative histological evaluation and one inadequate sample were without major complications (3, 5). Obviously, we recommend this approach only for the advanced stages of ovarian cancer to avoid tumor spillage by any diagnostic sampling method of ovarian carcinoma. In suspected cases with ovarian cancer candidate to neoadjuvant chemotherapy, an accurate tissue diagnosis is mandatory. Since cytology is not enough accurate as histology, it is better to obtain tissue biopsy as possible. To avoid the risk of iatrogenic abdominal wall metastasis, transvaginal core needle biopsy under the guide of sonography is a useful alternative method. Moreover, the risk of needle site metastasis is reduced by eliminating most of the upper vaginal wall during cytoreductive surgery (7, 8). We must note that the success rate of this procedure depends on the experienced operator, the depth of the biopsy target, the deflection tumor, encapsulates pelvic mass, and appropriate cases (7). A 100% success rate was obtained in our procedure due to skillful team. Another benefit of this method is that it is easier to perform than other exploratory procedures; thus, it can be alternative tissue sampling by laparoscopy or laparotomy and avoids general anesthesia. In addition, this procedure is associated with possible needle site metastasis. However, it permits applying optimal surgery when highly invasive surgery is anticipated. Likewise, less surgical time duration and more effective tumor debunking due to tumor shrinkage after neo-adjuvant chemotherapy are other advantages of this method (8). The median survival rate in patients with ovarian cancer in stage III c, IV, who achieved optimally debulked and adjuvant chemotherapy, was about 66 months. Half of the recurrences in these patients occurred during first 2 years after the end of treatment. Since the study took about 1 year, we did not have any recurrence at this time. Therefore, based on what was mentioned above, sonographic guided core needle biopsy led to the pathologic diagnosis of malignant ovarian masses with high accuracy and safety rate and omits the risk of needle site metastasis in suitable selected cases.

We did not have any limitations in this study and all patients had good cooperation with our team. Transvaginal core needle biopsy of ovarian mass under the guide of

Table 1. Demographic Characteristics of Patients Underwent Transvaginal Core Needle Biopsy Guided Sonography

Patient	Age	CA-125	Performance status	Pathology	Outcome
1	82	1100	0	High grade papillary serous	Optimal debulking after 4 courses of neoadjuvant chemotherapy
2	53	7600	0	Poorly differentiated adenocarcinoma	Optimal debulking after 3 courses of neoadjuvant chemotherapy
3	47	135	0	Papillary serous carcinoma	Optimal debulking after 3 courses of neoadjuvant chemotherapy
4	61	500	3	High grade papillary serous	Death after 3 courses of neoadjuvant chemotherapy due to morbidity of CVA and DM
5	48	700	0	High grade papillary serous	Optimal debulking after 3 courses of neoadjuvant chemotherapy
6	73	700	2	High grade papillary serous	Unacceptable chemotherapy or any other treatment
7	55	1500	1	Poorly differentiated papillary serous	Optimal debulking after 4 courses of neoadjuvant chemotherapy
8	53	260	0	Papillary serous carcinoma	Optimal debulking after 6 courses of neoadjuvant chemotherapy
9	72	1200	2	Poorly differentiated transitional carcinoma	Death after 2 courses of neoadjuvant chemotherapy due to COPD
10	45	5100	0	Papillary serous carcinoma	Optimal debulking after 4 courses of neoadjuvant chemotherapy
11	27	760	0	High grade mocinous cystadenocarcinoma	
12	65	2500	0	Papillary serous carcinoma	Optimal debulking after 4 optimal debulking

sonography is an acceptable and preferable approach in distinguishing ovarian cancer cases, which require neoadjuvant chemotherapy.

Since the overall follow up time of this study is short, more time is needed to evaluate the accurate benefit of this approach on the disease free survival in advanced ovarian cancer.

Acknowledgments

None declared.

Footnotes

Authors' Contribution: None declared.

Conflict of Interest: None declared.

Financial Disclosure: None declared.

References

1. Faulkner RL, Mohiyiddeen L, McVey R, Kitchener HC. Transvaginal biopsy in the diagnosis of ovarian cancer. *BJOG*. 2005;**112**(7):991–3. doi: 10.1111/j.1471-0528.2005.00619.x. [PubMed: 15958006].
2. Griffin N, Grant LA, Freeman SJ, Jimenez-Linan M, Berman LH, Earl H, et al. Image-guided biopsy in patients with suspected ovarian carcinoma: a safe and effective technique?. *Eur Radiol*. 2009;**19**(1):230–5. doi: 10.1007/s00330-008-1121-8. [PubMed: 18704437].
3. Thabet A, Somarouthu B, Oliva E, Gervais DA, Hahn PF, Lee SI. Image-guided ovarian mass biopsy: efficacy and safety. *J Vasc Interv Radiol*. 2014;**25**(12):1922–1927 e1. doi: 10.1016/j.jvir.2014.08.009. [PubMed: 25241300].
4. Spencer JA, Weston MJ, Saidi SA, Wilkinson N, Hall GD. Clinical utility of image-guided peritoneal and omental biopsy. *Nat Rev Clin Oncol*. 2010;**7**(11):623–31. doi: 10.1038/nrclinonc.2010.155. [PubMed: 20981128].
5. Volpi E, Zola P, de Grandis T, Danese S, Rumore A, Sismondi P. Pelvic mass biopsy by operative transvaginal sonography (OTVS). *Eur J Gynaecol Oncol*. 1991;**12**(6):477–80. [PubMed: 1809581].
6. Kitayama R, Nishizawa M, Tasaka R, Mita I, Tokuyama O, Miyama M, et al. [Transvaginal ultrasound-guided core needle biopsy for residual potentially malignant ovarian tumors in cases with severe peritoneal adhesion and frozen pelvis requiring polysurgery]. *Gan To Kagaku Ryoho*. 2015;**42**(5):641–3. [PubMed: 25981664].
7. Zikan M, Fischerova D, Pinkavova I, Dundr P, Cibula D. Ultrasound-guided tru-cut biopsy of abdominal and pelvic tumors in gynecology. *Ultrasound Obstet Gynecol*. 2010;**36**(6):767–72. doi: 10.1002/uog.8803. [PubMed: 20737454].
8. Siddiqui MM, Rais-Bahrami S, Turkbey B, George AK, Rothwax J, Shakir N, et al. Comparison of MR/ultrasound fusion-guided biopsy with ultrasound-guided biopsy for the diagnosis of prostate cancer. *JAMA*. 2015;**313**(4):390–7. doi: 10.1001/jama.2014.17942. [PubMed: 25626035].