

# The results of ultrasound-guided omental biopsy

## Ultrason eşliğinde yapılan omental biyopsi sonuçları

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**ÖZET:** Ultrasonografik incelemede karında asit ve omental kalınlaşma bulunan 35 hastaya ince iğne aspirasyon biyopsisi (İİAB) yapıldı. İntraabdominal malignite düşünülen ve primeri bilinen veya bilinmeyen 35 hastada omental İİAB değeri araştırıldı. Biyopsiler esnasında hiçbir komplikasyon olmadı ve 32 vakada malignite belirlendi (9 adenokarsinoma, 8 müsinöz adenokarsinoma, 10 mezotelyoma, 5 papiller adenokarsinoma). Tanı problemi olan ve ultrason ile omentum tutulumu belirlenen hastalarda bu yöntem ile tanıya götürebilme açısından pratik, ucuz ve güvenli bir işlemdir.

Anahtar Kelimeler: **Omentum, ultrasonografi, biyopsi**

**SUMMARY** Omental fine needle aspiration biopsies (FNAB) with ultrasound guidance were performed on thirty five patients with ascites and omental abnormalities. We present our results to indicate the ability of FNAB of the omentum to detect intraabdominal malignancies, with or without a known primary site. Biopsies were performed without complications and samples obtained were positive for malignancy in 32 cases (9 adenocarcinoma, 8 mucinous adenocarcinoma, 10 malignant mesothelioma and 5 papillar adenocarcinoma). We have concluded that this technique is safe, rapid and easy to perform in cases with omental abnormalities.

Key Words: **Omentum, ultrasonography, biopsy**

IN recent years, it has been possible to identify many intra-abdominal lesions by utilizing ultrasonography (US) as a routine diagnostic procedure. Invasion of the omentum is very common in disseminated intraabdominal malignancies. In addition to malignancies, omental infiltration can be caused by other diseases such as pancreatitis and tuberculosis. The result of such an infiltration is omental thickening and formation of nodular masses within the omental fat. Cytologic evaluation of omental pathologies were made by fine needle aspiration biopsy (FNAB) with ultrasound guidance. In addition to being noninvasive, this procedure is practical and has a high diagnostic accuracy (1).

In this study, we present the results of 35 ultrasound guided FNAB's of the omentum, performed to identify the etiology of malignant ascites, with or without known malignancy.

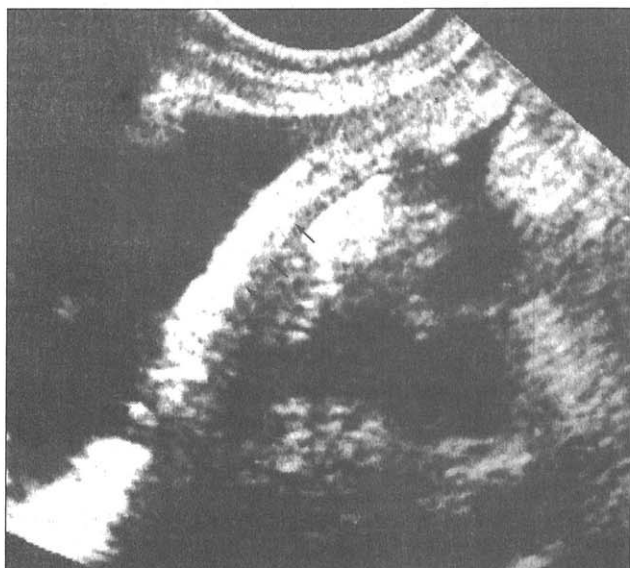
### MATERIALS AND METHODS

Twenty five patients were investigated in the department of Gastroenterology between July 1992 and December 1996. We studied 15 female and 20 male patients. The average age was 53.1 years for women and 57.4 years for men with the mean age for the entire group being 55 years. Ultrasonographic investigation showed evidence of ascites and omental thickening in all cases.

The omental tissue was investigated by a Toshiba SAL-77 A and SS A-270 A with a 3.5-5-7.5 MHz US sector probe. Coagulation times, platelet counts and clotting tests were all within normal limits in all of the patients. The biopsy area was first sterilized with povidone-iodine. After local anesthesia, a 21 gauge, 20 cm fine aspiration needle was introduced percutaneously into the pathologic omentum using linear biopsy probe guidance. The precise site of omental biopsy was the hypoechoic or nodular part. The aspirated material was immediately spread onto slides, which were examined by the cytology laboratory. Cytologic examination of ascitic fluid was also repeated in each patient. Further laboratory, radiologic and endoscopic investigations were planned for the prospective detection of the primary tumour.

### RESULTS

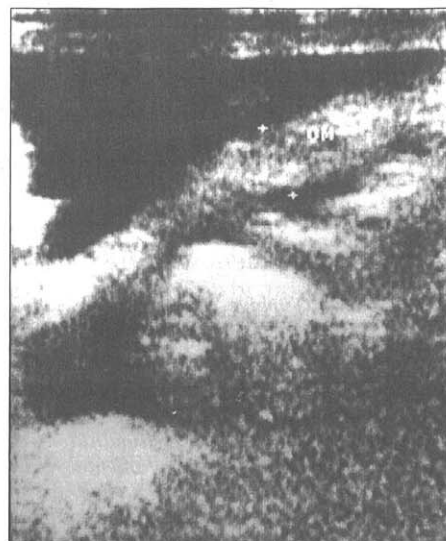
There were no complications in any of the patients. As ascites was present, the omentum moved closer to the anterior abdominal wall and this reduced the risk of complications. Estimated biopsy time was 15 minutes. In ascites, normal fatty omental tissue could be seen in some patients (Figure 1). Ultrasonographic evaluation of the pathologic omentum showed 3 different appearances: (i) A homogeneous appearance due to finely omental fat infiltration (interstitial pattern). The tumour cells partially involved omental fat tissue which



**Figure 1.** Hyperechoic appearance of normal omentum (arrows) in a patient with ascites (A:ascites) due to chronic liver disease.

caused a firm band with irregular contour on ultrasonographic images (Figure 2). (ii) Diffuse malignant cell infiltration of the omentum yielded hypoechoic, solid band formation with irregular contour (omental cake). Pathologic omentum was more thickened and fat tissue was diminished by abundant malignant cell involvement (Figure 3). (iii) The thickened omentum contained some often hypoechoic nodules (Figure 4). Careful evaluation of the pathologic omentum easily showed all these ultrasonographic images. Nine cases (25.7%) had liver metastases at the time of examination and out of 35 cases ultrasound detected the primary tumor in 12 (34.2%).

Cytologic results of the FNAB were positive for malignancy in 32 out of 35 cases these; 32 cases indicated the following malignancies: 9 adenocarcinoma, 8 mucinous adenocarcinoma, 10 malignant mesothelias and 5 papillary adenocarcinoma (Figure 5). Primary sites were established in 30 patients. Ten patients had peritoneal mesothelioma, 7 ovarian carcinoma; 6 colorectal carcinoma, 3 gastric carcinoma, 2 pancreatic carcinoma of the gallbladder. The primary tumour could not be found in 2 cases. There were no primary pathologies of the omentum. Most of the patients harbored metastatic malignancies which were too advanced undergo surgical intervention. Only 9 patients were admitted for surgery (4 colorectal, 3 ovarian and 2 gastric carcinoma) the others referred for Oncological examinations.



**Figure 2.** 56-year-old woman with colon carcinoma. Infiltrated omentum is 13 mm. thick with interstitial pattern.

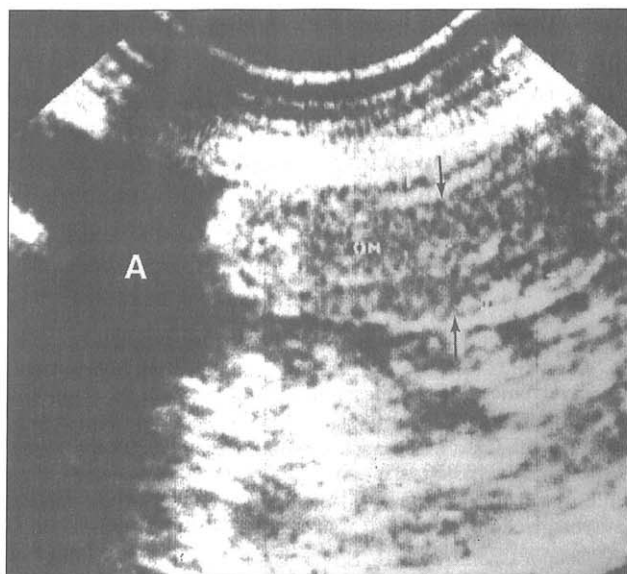
Cytology:  
Metastatic  
mucinous adenocarcinoma.

The 3 remaining cases were negative for malignancy in cytologic examination of abnormal omentum. However, two of these were diagnosed with tuberculosis and the third patient, an alcoholic with bloody ascites, was diagnosed as having pancreatitis.

## DISCUSSION

Ultrasonographic evaluation in certain ascitic patients with hyperechoic appearance can just represent normal fatty tissue of the omentum. Pathologic omental appearance can be the result of metastatic malignancies, inflammatory diseases, intra-abdominal hemorrhage and in rare cases primary omental neoplasms. Sistrom *et al* have reported the ultrasonographic patterns of omental involvement (1-3). Diffuse omental infiltration is usually due to malignancies of the following organs: ovary, uterus, cervix, stomach, colon pancreas, kidney or breast, or to lymphoproliferative diseases and epithelial tumour metastasis (4-6). Primary pathologies can be omental cysts, lipomas and solid tumours (7).

In pathologic conditions, omental tissue is thickened to various degrees and shows the same ultrasonographic characteristics. In ultrasonographic examination, the omentum gives a homogeneous appearance due to firm omental fat infiltration. The infiltration is sometimes more severe and always leads to hypoechoic solid band formation (omental cake). Another ultrasonographic appearance is the formation of a hypoechoic nodular mass within the omentum. In our cases, omental cake appearance was the dominant finding

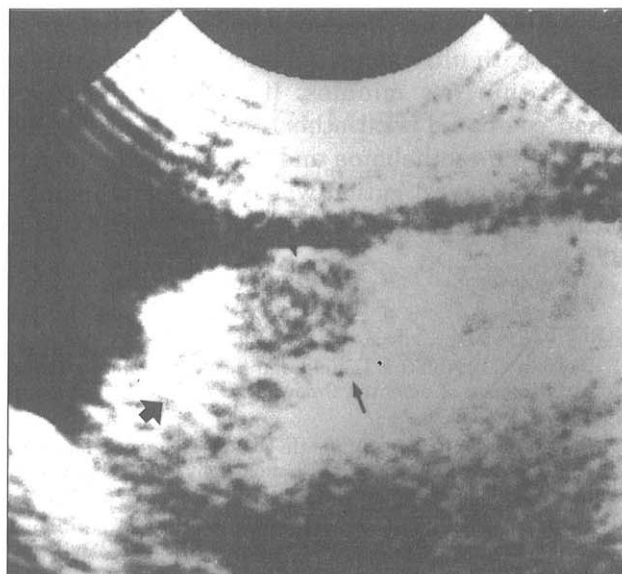


**Figure 3.** 66-year-old woman with ovarian carcinoma. Pathologic omentum (arrows) is 19 mm. thick (A:ascites). There is hypoechoic solid band formation (omental cake).

Cytology: Metastatic papillar adenocarcinoma.

(45.8%). The other ultrasonographic pattern was omental nodules in 12 cases (34.2%) and interstitial pattern in 7 cases (20%). There was no correlation between the ultrasonographic characteristics of the infiltration and the tumour type (1,8). The most frequent pattern noted in the study by Sistrom et al was the interstitial and the nodular appearances as considered by Rioux et al's study (1,3).

The pathologic omentum can be detected sonographically closely behind the abdominal wall. The omentum can be confused with intestinal structures. However, intestinal air-fluid, due to its appearance, is helpful in the differential diagnosis of abnormal omentum and significant detailed so-

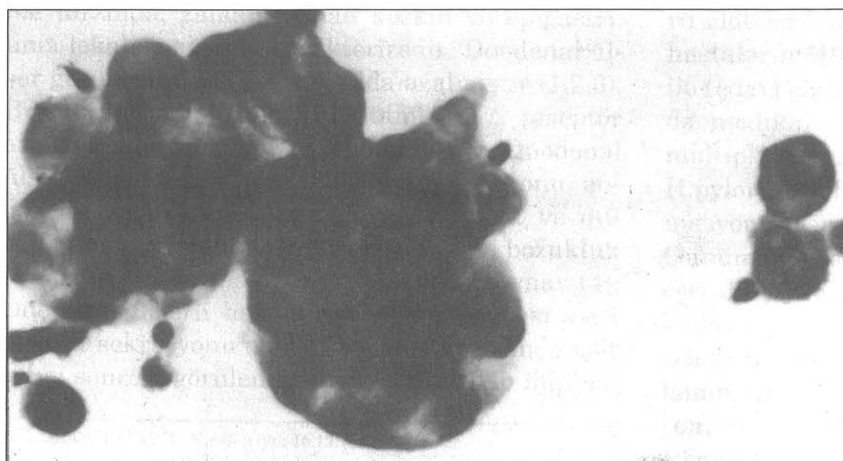


**Figure 4.** 48-year-old man with colon carcinoma. The infiltrated omentum is 26 mm thick (large arrow), and has a hypoechoic nodule (arrows).

Cytology: Metastatic adenocarcinoma.

nographic evaluation of the omentum necessitate at least a 5 MHz probe.

If the patients who are being investigated for the etiology of malignant ascites show omental infiltration on ultrasonographic examination, FNAB has proved to be a valuable intervention. The ascites push the omentum towards the anterior abdominal wall and this assists the physician in performing the biopsy easily. The fine diameter of the needle is also an important factor in reduction of complications FNAB can also be performed easily at the patient's bedside with portable equipment. The success rate of this procedure is high, but the diagnosis of the primary pathology is open to conjecture. Ultrasonography is a practical approach



**Figure 5.** FNAB of pathologic omentum of patient with metastatic papillar adenocarcinoma (Figure 3). The smear demonstrated numerous atypical epithelial tumour cells with papillar formation (MGx400).

to evaluate and diagnose many pathologies. FNAB, with ultrasound guidance, is easily performed within few minutes. It is relatively cheap when compared with other investigations. In 13 cases (10 mesothelioma and 3 ovarian carcinoma) no further investigation was needed, and histological diagnosis was made with FNAB (13/35; 37.1%).

In cases with ascites, where there are diagnostic problems, careful ultrasound examination of the omentum is very helpful. When the omental pathology is detected, FNAB should be performed for diagnosis of the primary sources of the disease. FNAB is a valuable, practical and inexpensive procedure with minimal risk of complications.

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