Fine Needle Aspiration Cytology of Metastatic Transitional Cell Carcinoma to the Liver†

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Abstract

A 63-year-old man presented with a three-month history of painless hematuria. A cystoscopic examination revealed a diffuse small nodulopapillary growth of the bladder mucosa. Biopsy resulted in the diagnosis of a transitional cell carcinoma (TCC), grade II. Therefore, total cystectomy with an ileal conduit was performed and the pathologic examination demonstrated a TCC grade II/III apparently confined to the mucosa. However, an ultrasonographic study carried out one year later revealed tumor masses in the pelvic cavity and the liver. FNA and needle biopsy of the liver were carried out and the diagnosis of a metastatic TCC was made from the former. Needle biopsy results pointed to a metastatic undifferentiated carcinoma, most likely originating from the TCC. The advantage of FNA is discussed. It is being used with increasing frequency to diagnose mass lesions in the liver and can identify metastatic tumors which have specific cytologic features that are different from primary liver tumor.

Key word : Fine Needle Aspiration, Cytology, Transitional Cell Carcinoma, Metastatic, Liver

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FNA has become a popular method for diagnosis of lesions from various sites of the body, and is now being used with increasing frequency to diagnose masses in the liver, particularly to separate primary liver tumors from metastatic tumors which have specific features for definite diagnosis. One of the tumors which can be identified in the liver, using FNA, is metastatic TCC.

TCC is a very aggressive neoplasm, with metastases developing most commonly in lymph nodes, liver, lung and bone[1]. For a definite diagnosis of TCC, there are many cytological criteria which have been discussed by Renshaw and Madge[2] and others[3,4]. This paper describes our experience with a 63-year-old man who presented with liver masses one year after a total cystectomy.

CASE REPORT

A 63-year-old Thai man presented with a 3-month history of painless hematuria and dysuria.

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Magnetic resonance imaging (MRI) studies revealed two tumor masses about 2.5 x 1.2 and 2.5 x 1.4 cm present in the dome and left infero-lateral part of the bladder respectively. The tumors demonstrated invasion of the deep muscular layer. The perivesical and perirectal fat were free from tumor. A cystoscopic examination revealed two sessile masses and diffuse small nodulopapillary growths of the bladder mucosa. The impression of intravenous pyelography (IVP) studies is a carcinoma of the bladder on the left side, with a possibility of invasion to the right distal ureter. A biopsy of bladder mucosa was taken and a definite diagnosis of TCC, grade II was made. Total cystectomy with ileal con-duit was therefore performed one week after the pathological diagnosis. Post-operative follow-up, by an ultrasonographic study one year later, revealed tumor masses in the pelvic cavity and multiple masses in the right and in the medial segment of the left lobe of the liver. FNA and needle biopsy of the liver were then performed under ultrasonographic guidance.

Pathologic observations

Cytologic specimens were obtained from multiple liver masses by fine needle aspiration biopsy using established methods. Dry smears were prepared and stained with Wright-Giemsa. Wet smears were prepared, fixed immediately in 95 per cent ethyl alcohol and stained by the Papanicolaou method.

On cytologic examination, the aspirate contained large numbers of malignant cells, either isolated or arranged in sheets, syncytia or irregular groups with a background of necrotic debris and blood. The neoplastic cells were intermediate in size and moderately pleomorphic. The nuclei were always eccentrically placed. They were large and hyperchromatic, with coarse chromatin and high nucleocytoplasmic ratios. Bizarre multinucleated forms and cells of prominent nucleoli were also seen. However, mononucleated cells were more prominent. Cercariform cells with many types of cytoplasmic tails were also seen (Fig. 1A, B, C). Such features are manifestations of metastatic TCC. One typical feature of high grade TCC, 'cannibalism' or a 'cell-in-cell' appearance was also evident in the present case (Fig. 2). Hence, the cytologic diagnosis of a metastatic high grade TCC was made.

Immunocytochemistry showed positive staining of the tumor cells with antibodies to epithelial membrane antigen (EMA) and negative staining for carcinoembryonic antigen (CEA) and alpha-fetoprotein (AFP).

Fig. 1. Cercariform cells of metastatic TCC. (A) Cytoplasmic tail resembling a fish tail. (B) Tail with parallel borders and flattened end. (C) Cells with very long tail (Papanicolaou stain, x600).

Fig. 2. Cell-in-cell arrangements or cannibalism are apparent (Papanicolaou stain, x600).

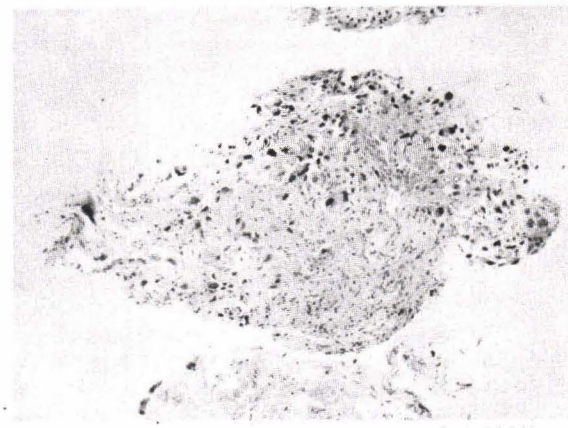

Fig. 3. Histology of metastatic carcinoma. This liver biopsy shows a foci of pleomorphic cells with hyperchromatic nuclei (H&E stain, x100).

Histologic examination of liver needle biopsy revealed foci of large pleomorphic cells with coarse chromatin and prominent nucleoli (Fig. 3). The interpretation of liver needle biopsy was undifferentiated carcinoma, most likely a metastatic TCC.

DISCUSSION

Bladder carcinoma accounts for 3 per cent of deaths from cancer in the United states. More than 90 per cent are urothelial in origin. TCC of the bladder is usually a disease of adults, predominantly men. The mean age of patients is 60-65 years, but younger persons may also be affected[5]. Clinical evidence of metastases from TCC of the bladder has been obtained in approximately 10 per cent of the patients[6]. However, the rate is much higher in autopsy studies[7]. For example, a study of 107 patients with biosy-proven TCC of the bladder demonstrated evidence of metastases up to 60 per cent. The appearance of both primary and metastatic TCC in FNA specimens has been reported by Santamaria et al[8]. The cytologic features of metastatic TCC have been described by Johnson and Kini[9]. From their experience with 18 cases, the TCC demonstrated spindle shaped and pyramidal malignant cells with eccentric nuclei together with cercariform cells. All of the tumors were of high grade malignancy.

The term cercariform cell was introduced and defined by Powers and Elbadawi[10]. They considered the typical long, cytoplasmic tails with flattened ends to be the result of differentiation toward pseudostratified epithelium. Ranshaw and Madge presented evidence that abundant cercariform cells in a FNA are characterisitic of a transitional origin[2]. In the present case, cytologic diagnosis of metastatic TCC could be made on the basis of the cellularity of the malignant cells. The cercariform cells and cannibalism in particular were the clear evidence of metastatic TCC.

Immunocytochemical staining for AFP, CEA and EMA can be used to confirm routine cytologic diagnosis. The needle biopsy could not give a definite diagnosis of metastatic TCC because only a small area of malignant cells can be examined. Thus, FNA is more sensitive in cases of denuded epithelium on biopsy or multiple lesions. An FNA diagnosis of metastatic carcinoma of the bladder is essential in order to ensure appropriate chemotherapy and/or radiation treatment.

In conclusion, FNA is an inexpensive method of detecting a metastatic TCC from the urinary bladder. It is also a safe and well tolerated method, with a low morbidity and no mortality.

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เซลล์วิทยาการเจาะดูดของมะเร็งชนิดทรานซิชันนัลที่แพร่กระจายมาที่ตับ†

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ผู้ป่วยชายไทยอายุ 63 ปี มาด้วยอาการปัสสาวะเป็นเลือดมา 3 เดือน การตรวจกระเพาะปัสสาวะโดยการส่องกล้องพบก้อนเนื้อเล็ก ๆ กระจายทั่วผิวด้านในกระเพาะปัสสาวะ จากการตัดชิ้นเนื้อกระเพาะปัสสาวะส่งตรวจทางพยาธิวิทยาได้รับการวินิจฉัยเป็นมะเร็งชนิดทรานซิชันแนลเกรด 2 จึงได้ทำการผ่าตัดกระเพาะปัสสาวะพบว่าเป็นมะเร็งชนิดทรานซิชันแนลเกรด 2/3 ซึ่งพบเซลล์มะเร็งเฉพาะชั้นเยื่อบุผิว หนึ่งปีต่อมาตรวจพบก้อนเนื้องอกในช่องท้องและตับจากการตรวจโดยคลื่นเสียงความถี่สูง จากการเจาะดูดเซลล์มาตรวจพบว่าเป็นมะเร็งชนิดทรานซิชันแนลที่แพร่กระจายมาจากกระเพาะปัสสาวะ ผลการตัดชิ้นเนื้อตับมาตรวจทางพยาธิวิทยาได้รับการวินิจฉัยว่าเป็นมะเร็งชนิดอันดิฟเฟอเรนทิเอทที่แพร่กระจายจากที่อื่น

สรุปแล้วเซลล์วิทยาการเจาะดูดเป็นวิธีที่ทำง่าย ไม่แพง และรวดเร็วสำหรับการวินิจฉัยมะเร็งชนิดทรานซิชันแนลที่แพร่กระจายมาจากกระเพาะปัสสาวะ ซึ่งนิยมใช้กันมากในการวินิจฉัยก้อนเนื้องอกในตับทำให้สามารถแยกชนิดมะเร็งแพร่กระจายที่มีลักษณะจำเพาะทางเซลล์วิทยาที่ต่างไปอย่างชัดเจนจากมะเร็งตับได้

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