Fine Needle Aspiration Cytology of Thymoma†

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Abstract

Thymoma is the 2nd most common mediastinal tumor found in Thai people. Cytologically it has a characteristic biphasic cell pattern and can be differentiated from other mediastinal lesions. We reviewed 14 aspirated samples, initially diagnosed as thymoma among a total of 80 mediastinal aspirations, obtained during a period of 6 years. Revised cytologic diagnosis was made and compared with histopathology from needle biopsy, surgical biopsy and surgical removal in each case. All cytologic samples revealed a mixture of epithelial cells and lymphocytes in varying proportions. Histopathologic samples were available in 13 patients and showed 12 thymomas and 1 immature teratoma. While all thymomas revealed characteristic cytologic features, a case of mediastinal immature teratoma with unsatisfactory aspirated sample revealed resembling features and it was very difficult to differentiate such a tumor from thymoma.

Key word : Aspiration Cytology, Thymoma

Thymoma is a common tumor in mediastinum. Cytologically it has characteristic features and can be differentiated from other mediastinal lesions. This article describes the results of fine needle aspiration (FNA) of thymoma which the authors have experienced over the past 6 years.

MATERIAL AND METHOD

All aspirated samples from the patients with mediastinal tumor initially diagnosed as thymoma at the Central Chest Hospital during October 1992 and February 1998 were reviewed. There were 14 cases found among a total of 80 cases of mediastinal FNAs. The samples were obtained by percutaneous transthoracic FNA under the guidance of ultrasound or computed tomography. The aspirates were smeared on glass slides, fixed in 95 per cent ethyl alcohol for 30 minutes and stained by Papanicolaou method. Interpretation of the cytologic samples as thymoma was done by the presence of a

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Table 1. Results of cytologic and histologic diagnosis in each patient.

case No	initial FNA Dx	revised FNA Dx	Tru-Cut Bx	Surgical Bx	Surgical Removal
1	T-m	T-m	T-m	—	T-m
2	T	T-e	T-e	—	T-e
3	T-e	T-e	not Dx	—	T-e
4	T-e	?T-e	not Dx	—	tera
5	T-e, tera	T-e	T-e	T-e	—
6	T-e, tera	T-e	—	T-e	—
7	T	T-e	T-e	—	—
8	T-e	T-e	T-e	—	—
9	T-e	T-e	T-e	—	—
10	T-e	T-e	T-e	—	—
11	T-e	T-e	T-e	—	—
12	T	T-m	T-m	—	—
13	T, ML	T-l	T-l	—	—
14	T	T-l	—	—	—

T = Thymoma; e = epithelial type; m = mixed type; l = lymphocytic type
tera = teratoma; ML = Malignant Lymphoma; — = Not performed

Fig. 1. The cytologic sample from case 2 revealed a mixture of epithelial cells and lymphocytes on the smear. (Papanicolaou stain x 400)

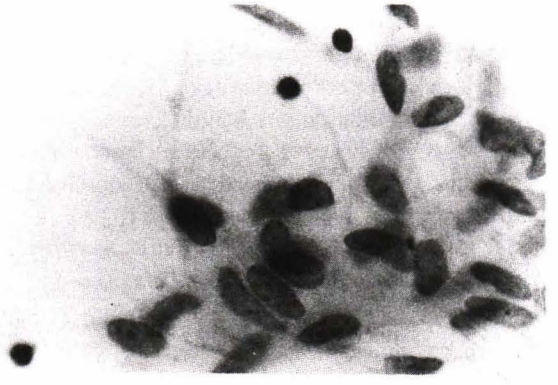

Fig. 2. The cytologic sample from case 2 revealed features of thymic epithelial cells in details. (Papanicolaou stain x 1,000)

mixture of epithelial cells and lymphocytes on the smear. The tumor cell types were determined by the predominant cells in the samples as epithelial type, mixed type or lymphocytic type. After reviewing the sample in each case, cytologic diagnosis was revised and compared with histopathologic diagnosis from Tru-Cut biopsy, surgical biopsy and surgical removal.

RESULTS

Table 1 outlines the results of cytologic diagnosis and histopathologic diagnosis in each patient.

The FNA samples from all 14 cases revealed a mixture of epithelial cells and lymphocytes in varying proportions which were interpreted as thymoma (Fig. 1). The thymic epithelial cells were dispersed or arranged in cohesive fragment and showed round to oval nuclei with fine nuclear chromatin, inconspicuous nucleoli and slight nuclear pleomorphism. These cells had a moderate amount of cytoplasm and showed an indistinct cytoplasmic border (Fig. 2). Mature lymphocytes were intermingled with these epithelial cells. The FNA samples revealed predominant epithelial cell in 10 cases, mixed epithelial cell and lymphocyte in 2

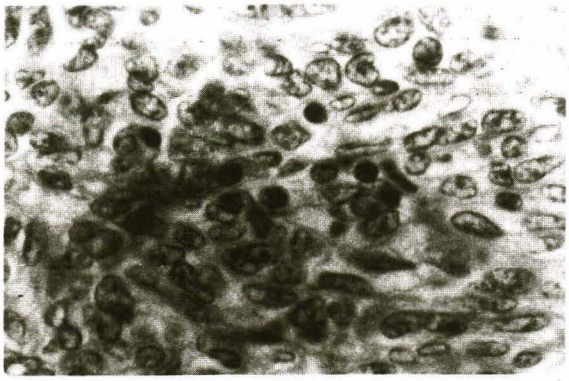

Fig. 3. Histopathologic features of thymoma, from the same case as figure 2, are corresponding with those of cytology. (H&E stain x 1,000)

cases and predominant lymphocyte in 2 cases. These cytologic features corresponded with those of histopathology in the same case (Fig. 3). From initial cytologic interpretation, we had differential diagnosis in some cases such as epithelial component of mediastinal teratoma in the cases of thymoma with predominant epithelial cell (case 5 and 6) and malignant lymphoma in the case of thymoma with predominant lymphocyte (case 13). All revised cytologic diagnoses were thymoma. In case 4 we considered the sample was limited to a small amount of cellularity and revealed only a few cohesive fragments of epithelial cells with bland nuclei on the background of lymphoid cells. Histopathologic samples were available in 13 cases. From 12 samples of Tru-Cut biopsy, ten revealed thymoma while the other two were not diagnostic and revealed fibrous tissue and necrotic tissue (case 3 and case 4 respectively). We performed exploratory thoracotomy in 6 cases. The tumors were unresectable in 2 patients. So surgical biopsies were performed and revealed thymomas. The other 4 patients underwent surgical removal and revealed 3 thymomas and 1 mediastinal immature teratoma (case 4).

DISCUSSION

The incidence of thymoma varies in different series. The study by Wongsangiem et al in 1996 analyzing 190 cases of mediastinal tumors in the Thai population revealed that thymomas were the second most common tumors in their series and composed of 30 per cent of all cases[1]. When we approach the patients with mediastinal tumors, we always perform imaging studies such as computed tomography of the chest to determine the features and resectability of the tumors. In order to have pathologic diagnosis prior to management, these diagnostic procedures should be performed: FNA, Tru-Cut biopsy and surgical biopsy[2]. For most cases of thymoma, diagnosis can be made by this procedure of FNA because the cytologic features are characteristic. The study by Tao et al reviewing the FNA samples of 37 thymomas which was the largest series indicated that the cytologic features of thymoma observed in aspiration biopsies were sufficiently distinctive from those of other anterior mediastinal tumors to be diagnostic[3]. Sajjad et al described the cytologic features of thymoma as dimorphic cell population of small mature lymphocytes admixed with epithelial cells[4]. Dalgren et al reviewed the FNA samples of 17 thymomas and 6 other mediastinal tumors and described that thymomas had a characteristic biphasic cell pattern in material obtained by FNA. However, one case of mediastinal carcinoid tumor in their series revealed such features[5].

From our series, all 14 FNA samples revealed a mixture of epithelial cells and lymphocytes in varying proportions which were interpreted as thymomas. They were verified histologically in 12 cases. However, surgical removal from one patient (case 4) revealed mediastinal immature teratoma. Reviewing the cytologic smear and histologic sections in this case, we considered that the former was limited to only the two components from the heterogeneous tumor that was derived from three germ cell layers.

We agreed with those studies that the cytologic features of thymoma were characteristic and revealed dimorphic or biphasic cell pattern, composed of a mixture of thymic epithelial cells and thymic lymphocytes in varying proportions. However, to interpret the FNA sample of mediastinal lesions by cytology alone, from our experience, the unsatisfactory sample of mediastinal immature teratoma revealed such features without any other teratomatous components and misled us to interpret it as thymoma.

SUMMARY

A series of 14 cases of mediastinal tumor initially diagnosed as thymoma by cytology were

reviewed. All cytologic samples revealed a mixture of epithelial cells and lymphocytes in varying proportions. Histopathology confirmed thymoma in 12 cases and revealed mediastinal immature teratoma in 1 case. Cytologic interpretation could be done accurately in most cases of thymoma because of the characteristic features. However, it was very difficult to interpret an unsatisfactory sample from a case of mediastinal immature teratoma with cytologic features resembling thymoma.

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เซลล์วิทยาของสิ่งเจาะดูดจากเนื้องอกชนิดธัยโมมา†

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ธัยโมมาเป็นเนื้องอกที่พบได้เป็นอันดับ 2 ที่ตำแหน่งเมดิแอสตินัมในประชากรไทย เนื้องอกชนิดนี้แสดงลักษณะเฉพาะทางเซลล์วิทยา และสามารถแยกได้จากรอยโรคอื่น ๆ ที่เมดิแอสตินัม ได้ทำการศึกษาผู้ป่วย 14 รายที่ได้รับการวินิจฉัยว่าเป็นธัยโมมา จากตัวอย่างทางเซลล์วิทยาของสิ่งเจาะดูดที่เก็บจากตำแหน่งเมดิแอสตินัมทั้งหมด 80 ราย พบว่าตัวอย่างทั้งหมดประกอบด้วยเซลล์เอปิธีเลียม และเซลล์ลิมโฟซัย หลังจากที่ทำการตรวจตัวอย่างเหล่านี้ซ้ำ ได้ทำการเปลี่ยนแปลงแก้ไขการวินิจฉัยทางเซลล์วิทยาใหม่ และเปรียบเทียบกับการวินิจฉัยทางจุลพยาธิวิทยา ในผู้ป่วยแต่ละราย ผลการตรวจทางจุลพยาธิวิทยา จากผู้ป่วย 13 รายพบว่าเป็นธัยโมมา 12 ราย และเทอราโทมา 1 ราย คณะผู้รายงานสามารถให้การวินิจฉัยธัยโมมาโดยวิธีทางเซลล์วิทยาของสิ่งเจาะดูด ได้อย่างถูกต้องแม่นยำ เนื่องจากมีลักษณะเฉพาะ อย่างไรก็ตาม ตัวอย่างที่จำกัดเพียงบางส่วนจากเนื้องอกชนิดเทอราโทมา 1 รายก็แสดงลักษณะทางเซลล์วิทยาที่คล้ายคลึงกันและแยกได้ยากจากธัยโมมา

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