Elastofibroma dorsi is a slow growing tumor typically located at the posterior-lateral chest wall between the ribs and the anterior serratus muscle and deep to the inferior angle of the scapula. This lesion can occur bilaterally and may appear asynchronously. Clinically, this pseudotumor presents as a slowly growing painless lump. Histologically, elastofibroma dorsi is a mesenchymal soft tissue tumor intermingled with fat and elastic fibers in a collagenous fibrous background. Since the reported prevalence of elastofibroma dorsi varied widely in the literature, this study is aimed to estimate the prevalence of this lesion with retrospective evaluation of CT images in patients of various clinical conditions. After a retrospective review of 663 CT files, only four cases with elastofibroma dorsi were found. They were two women and two men. One male was bilaterally involved and the others unilaterally. Of these 4 cases, 3 were asymptomatic about the lesion at the time of CT examination and after one to three-years’ follow-up. The only symptomatic case received CT with complaint of painless back lump. This patient received operative resection and remained symptom-free after four-years’ follow-up. This study showed that the prevalence of elastofibroma dorsi is extremely low in Taiwan (0.6%) based on retrospective review of CT.

Elastofibroma dorsi is a rare benign tumor located at the tip of the scapula, commonly in the elderly. After its first report in 1961 [1], some reports have described the clinical and histological features of the tumor. Additionally, the imaging findings of elastofibroma dorsi in CT, MRI and ultrasound have been well documented in recent years.

The reported prevalence of elastofibroma dorsi varied widely in the literatures. The highest prevalence reported was based on the autopsy study, which showed a 24% prevalence in the women and 11% in the men [2]. In contrast, Brandser et al reported a very low prevalence of 2% based on the CT finding [2].

The aim of this study was to determine the prevalence of elastofibroma dorsi based on the retrospective review of the CT images in the Taiwan population.

MATERIALS AND METHODS

Totally six hundred and sixty three CT files were retrospectively reviewed for the presence of elastofibroma dorsi. The indications for the CT examination varied widely, but most were examined for suspected problems of the thoracic cavity. The patients were scanned with Picker PQS scanner (Picker, USA). The studies were spirally acquired with a slice thickness of 8 mm, pitch of 1.5:1 and a reconstruction interval of 8 mm. For the purpose of this study, any patient with history of previous surgical intervention at the shoulder region was excluded. All scans included images obtained with mediastinal and lung window settings. All of the examinations were performed after
intravenous injection of 100 ml iodinated contrast medium with injection rate of 3 ml/sec.

The images were retrospectively reviewed by two qualified radiologists to search for the presence of elastofibroma dorsi. The lesion was recognized as a posterolateral chest wall mass with soft tissue density lying deep to the scapular tip, serratus anterior, latissimus dorsi and levator scapulae muscles but superficial to the ribs. The medical records were then reviewed for the patients that bearing the elastofibroma dorsi. The data from the medical records including the clinical history, the laboratory and imaging studies that were related to the elastofibroma dorsi, and the progress of the disease after follow-up were collected.

RESULTS

Four patients were found to have the elastofibroma dorsi based on the retrospective review of the CT files. They were 53, 63-year-old female and 44, 73-year-old male. The 73-year-old male had bilateral lesions and the rest had unilateral lesion (two on the right side and one on the left side). One of the cases received operation for the elastofibroma dorsi under the impression of soft tissue tumor on the chest wall (Fig 1). Pathologically the mass was composed of elastic fibers intermixed with underlying fibrous and fatty tissues, consistent with the diagnosis of elastofibroma dorsi. Other patients underwent the CT examination with symptoms not related to the mass (interstitial lung disease: 1, suspicious lung mass: 1 and hilar lymphadenopathy: 1) and no biopsy or operation was performed for the chest wall masses (Fig 2, Fig 3, Fig 4). Reviewing the CT reports of these three patients, no chest wall mass was mentioned of. The first case that received the operation had no tumor recurrence after four-years’ follow-up. The other three patients that did not receive the operation or biopsy had no related symptom after following up for one to three years according to the medical record.

DISCUSSION

Elastofibroma dorsi has been identified in the literatures for many years, typically located at the scapular tip as an asymptomatic mass. It histopathologically consists of numerous degenerated elastic fibers with an abundant collagen fibrillar matrix in a fatty background [3]. The name “elastofibroma dorsi” implies its typical location and microscopic features. Located anterior to the scapula tip, it lies also deep to the serratus anterior, latissimus dorsi and levator scapulae. Other locations for elastofibromas have also been noted and multiple elastofibromas have been described as occurring in the scapula and olecranon and in the scapula and ischial tuberosity [4].

The pathogenesis of elastofibroma dorsi is unknown. It was suggested to develop as a result of abnormal degeneration or reaction of elastic fibers after repetitive minor traumas [5,6], which explained the right-side predominance of the lesions reported [2]. In our four cases with five lesions (one case with bilateral lesions), three were on the right side. Recent chromosomal study revealed no consistent abnormality in 27 cases of elastofibroma dorsi [7].

The reported age and gender distributions of
elastofibroma dorsi varied widely. It is initially regarded as a disease of elderly, with age range between 49 and 71 years [8]. However, many cases in the younger age have been noted as well. Women have been claimed more commonly affected than men, with a ratio as high as 13:1 [2]. However, other reports have on the other hand noted predominance in men [9][10].

In the autopsy series, the prevalence of elastofibroma dorsi is much higher than the 0.6% prevalence found in our study, which is predictable in view of the fact that pathologists could identify the abnormality at the microscopic level, while CT detects the lesion only when it appears as a mass. Using CT as the tool, Brandser et al [2] likewise identified a low prevalence of 2% in the elder asymptomatic population. Because our study population was not limited by the age or symptomatology, our data represents more closely to the real prevalence that happens in the general population.

In addition to a tender or non-tender mass at the posterolateral chest wall, the symptoms of elastofibroma dorsi may include pain or clicking sensation during motion of the arm [11]. While only one case of our series was of bilateral type, bilateral lesions were not rare in the literatures, which may be synchronous or asynchronous [1].

Radiologically, the CT, MRI or sonographic images can demonstrate the characteristic streaky collagen or elastic fibers of elastofibroma dorsi in the fatty background [12-16]. Among them, CT often shows poorer differentiation of tumor edges from surrounding muscle planes compared with other two modalities, but the characteristic location and appearance often suggest the diagnosis easily.

The necessity of biopsy for the diagnosis of elastofibroma dorsi is controversial. Many researchers believe that the characteristic location and imaging appearance of elastofibroma dorsi is diagnostic, especially in bilateral lesions [13]. Other researchers advise the biopsy procedure to exclude more aggressive tumors [17]. The asymptomatic patients in our series did not receive any interventional diagnostic procedure, but remained symptom-free after one to three-years’ follow-up. Recently, the findings of fine needle aspiration of a hypocellular aspirate with auto-fluorescent elastic fibers were suggested as clues of elastofibroma dorsi [18].

In spite of the characteristic imaging features of elastofibroma dorsi, it is often missed in the initial interpretation, partly due to the asymptomatic nature of the tumor. In our series, only one of the lesions was identified in the initial CT (but not correctly diagnosed), because it was the only symptomatic case.

There were several limitations of this study. First, in spite of that we aimed to evaluate the true prevalence of the elastofibroma dorsi in the general population, our study group consisted of patients receiving CT examinations for a variety of indications, in which the age was not evenly distributed, but consisted of mainly adult peoples. Second, only one of our four patients had the pathological proof of the diagnosis, this is due to the retrospective design of our study. However, the biopsy of an incidentally discovered elastofibroma dorsi with typical imaging and clinical picture is not indicated actually, because of its benign nature. The patients that did not receive biopsy or operation have remained symptom-free after one to

Figure 3. A 44-year-old male received CT examination due to left lung mass. A soft tissue mass (arrow) over left subscapular region was noted.

Figure 4. A 73-year-old male received CT examination under the impression of hilar lymphadenopathy. CT showed bilateral subscapular fusiform soft tissue masses with subtle fatty striation (arrow).
three-years’ follow-up.

In conclusion, familiarity with the clinical and imaging characteristics of elastofibroma dorsi is warranted, this may avoid the patient from an unnecessary operation, in spite of that the prevalence of this disease is very low in the Taiwan population as this study has disclosed.

REFERENCE

以回溯性電腦斷層攝影評估背部彈性纖維瘤的盛行率

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背部彈性纖維瘤是生長在胸壁後外側的良性腫瘤，多半位於肩胛骨下端之內側。背部彈性纖維瘤可雙側發生，而雙側病灶可同時或不同時出現。臨床上，背部彈性纖維瘤的症狀常為生長在後上背部無痛性、生長緩慢的腫塊。組織學上，可見到脂肪、纖維組織及彈性纖維交織而成的軟組織腫塊。由於在文獻上對於背部彈性纖維瘤的盛行率報告相當分歧，本研究乃藉由回溯性評估電腦斷層影像，以了解背部彈性纖維瘤在台灣的盛行率。結果顯示，在663位因各種原因而接受胸腔電腦斷層檢查的病患中，只有4例出現背部彈性纖維瘤，其中2例為女性2例為男性。1例男性為雙側病灶，額三例為單側病灶。4例中有3例在接受電腦斷層攝影時臨床上未出現症狀，在追蹤一至三年後，亦未出現與背部彈性纖維瘤有關之症狀。另一例則是因胸壁後外側觸及腫塊而接受電腦斷層檢查，在接受手術切除後四面並未出現復發。本研究顯示，相對於以往在組織學上11%至24%之盛行率報告，背部彈性纖維瘤在台灣是相當罕見的疾病，以電腦斷層檢查所作的回溯性評估，在一般人口中僅有0.6%之盛行率。

關鍵詞：電腦斷層攝影，背部彈性纖維瘤，盛行率