Research Progress on Metastatic Carcinoma of the Spleen

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ABSTRACT Metastatic carcinoma of the spleen (MCS) is a rare condition which is frequently misdiagnosed. Research progress on the prevalence, clinicopathological features and diagnosis of MCS from the Chinese and English medical literature was reviewed to increase understanding of all aspects related to MCS. It is hoped that a better comprehension of MCS will increase the diagnostic level and the rate of MCS detection.

KEYWORDS: neoplasm, spleen, tumor metastasis, pathology, clinical diagnosis.

Metastatic carcinoma of the spleen (MCS) is considered to be rare, with case reports only occasionally seen in the Chinese and English medical literature. Extensive studies of the clinicopathologic features of MCS have seldom been conducted. It has been reported that its rate of misdiagnosis is high. To enhance the understanding of the prevalence, clinicopathological features and means to diagnose MCS, research progress on MCS from the Chinese and English medical literature was reviewed to increase awareness of MCS and improve diagnostic methods and detection of this condition.

Prevalence of MCS

Splenic metastases are a clinical rarity compared to those seen in autopsies. The spleen is involved in metastatic malignancy in 6–13% of autopsies. Traditionally splenic metastases have been thought to occur late in a course of widely disseminated cancer, with the incidence of splenic involvement increasing up to 50% of cases where four or more solid organs are simultaneously involved. The improvement of imaging techniques and the advent of extensive use of imaging modalities, such as CT scans and magnetic resonance imaging (MRI) in cancer patient follow-up, have led to the identification of an increasing number of splenic metastases from different types of solid tumors. Thus our traditional ideas have been challenged. A review of the Chinese medical literature regarding MCS (not including metastatic sarcoma of the spleen) between 1949 and 2004, resulted in a total of 98 cases (named "Chinese series") with complete clinicopathological data (all almost were individual case reports). The age of the 98 patients (49 of each gender) ranged from 20–82 years (mean 52.7 years). The patients aging 31–70 years comprised 88.8% of the total. The mean age of the males was younger than females (49.4 vs. 54 years). The onset peak age of the males (31–70 years accounting for 87.8%) was younger than females (41–70 years accounting for 79.6%), a difference of approximately 10 years. Lam and Tang in Hong Kong re-
ported that the ratio of males to females was 1.7:1, and the age of the patients ranged from 11–85 years (mean 60 years). The patients of 70–80 years comprised 67%. The detection rate of MCS at autopsy and study of splenectomy specimens was 0.6% and 1.1% respectively. However, the reported rates in the Chinese medical literature were in 6.5% and 1.3%, respectively.1,5

Most of the MCS reported in the English literature also have been individual case reports resulting in more females than males. The age of the patients ranged from 11–84 years and most of these patients were 50–70 years old.2,4 Splenic metastases ranked 10th among the 44 metastatic sites described in the literature.4-10 Autopsy studies from the English literature showed a MCS detection rate to be 2.3–13%.2,14 In cases of epithelial ovarian cancer, it may reach 19–52%.8 Studies of splenectomy specimens showed it to be less, namely 5% to 7.4% (31/417 cases).8,10

Explanations proposed for the clinical relative paucity of splenic metastases have included: anatomically, the sharp angle where the splenic artery branches from the celiac artery; the scarcity of afferent lymphatic vessels may limit tumor metastasis; the rhythmic contraction and the antitumor activity of the spleen, e.g., the splenic factor (a humoral substance produced in the spleen), macrophages, which squeeze out a tumor embolus and prevent its lodging and growing in the spleen.11,14 However, there are authors who think that the low detection rate may involve some other rational causes. First, splenic biopsies performed at surgery in the past have been relatively rare. Even when splenectomy specimens were taken, the pathological examinations were not always carefully performed. Second, it is possible that MCSs were missed at diagnosis because of careless gross inspection of the splenic lesions by pathologists and of insufficient numbers of histological blocks prepared from the splenectomy specimens.11

Pathological Features

Size and distribution of MCS foci

In combined operative and imaging findings, 89 (90.8%) of 98 patients in the Chinese series were found to have a MCS focus. Among 80 (81.6%) patients who had a reliable clinical record, the maximal diameter of their focus was from 0.8 cm to 20 cm with a mean of 6.7 cm greater than the 1.4 cm reported by Lam and Tang.3 Most of the foci were involved in the upper pole, under pole or hilus of the spleen, and a few patients showed a complex involvement of the upper pole, the hilus and the capsule of the spleen or the under pole, the hilus and the capsule of the spleen.11

The mean weight of the spleens with metastases was 143–178 g, so splenomegaly generally not to occur.12 Paolini et al.12 reported the a case of splenomegaly in which the initial manifestation was due to splenic metastasis from thyroid follicular adenocarcinoma. Occasionally, the spleen due to splenic metastases may weigh up to 1230 g (from endometrioid carcinoma of the ovary)13 or 1250 g (from squamous cell carcinoma of the lung).14

Macroscopic typing

Macroscopical findings of MCS foci may present as mono-nodule, multi-nodule, diffuse infiltration and cysts.0,2 The gross lesions of 21 MCS reviewed by Smart et al.12 showed there were 5 cases for each of the mono-nodule, the multi-nodule and diffuse types, and no known pattern for 6 cases. Among the 74 cases reported by Lam and Tang,3 31 cases were mono-nodule type, 30 were multi-nodule, 5 diffuse and 8 cases predominately involved the splenic capsule. In the Chinese series 48 cases were mono-nodule, 36 multi-nodule, 3 diffuse, 2 predominately involved the splenic capsule, and for 9 case records were unknown. Liu et al.9 had classified MCS into 4 types including nodular, diffuse, miliary and capsule. According to this classification, the nodular type was the most common (accounting for 85.7%) but the diffuse and the capsular types were seldom seen in the Chinese series. However, there were no miliary-type lesions in the Chinese series cases or in cases reported by Lam and Tang,3 indicating that this type of lesion is uncommon.11

Histopathological typing

Almost all common tumors have been reported at some time to give rise to splenic metastases. The tumors that most commonly metastasized to the spleen were melanoma (34%), breast (12%), ovary (12%) and lung (9%) carcinoma. The less common tumors were choriocarcinoma, esophageal and endometrial.2-6 Occasionally, splenic metastases came from parotid,11 bladder,12 prostate12 or testis carcinoma,11 pseudomyxoma peritonei15 or a ovarian granulosa cell tumor.15 Among the Chinese cases, the most common source of metastases to the spleen were from ovarian adenocarcinoma (17.4%), liver (15.3%), colon (15.3%), lung (10.2%), pancreas (10.2%) and stomach (8.2%) carcinoma followed by esophageal, choriocarcinoma (each 4.1%), papillary adenocarcinoma of the thyroid