jnm/CASE REPORT

RESOLUTION OF INCREASED SPLENIC SIZE AND UPTAKE OF ^{99m}Tc-SULFUR COLLOID FOLLOWING REMOVAL OF A MALIGNANT MELANOMA

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Increased splenic uptake of ^{99m}Tc-sulfur colloid (TcSC) in patients with malignant melanoma and no evidence of liver disease has recently been reported. In a similar patient serial liver–spleen studies demonstrated the resolution of splenomegaly and increased splenic uptake of TcSC following the surgical removal of a malignant melanoma of the eye.

Malignant melanomas can produce tumor-specific antigens which are capable of stimulating cell-mediated immunity (*1–4*). Goldman, et al recently reported that 10 of 29 patients with malignant melanoma and no evidence of liver disease had increased uptake of ^{99m}Tc-sulfur colloid (TcSC) by the spleen (*5*). In a similar patient mild splenomegaly and increased splenic uptake of TcSC resolved following removal of a malignant melanoma of the eye.

CASE REPORT

A 46-year-old man presented with the complaint of decreasing vision in the left eye over several months. The patient had no other complaints. Ocular examination revealed an endophytic pigmented tumor covering one third of the posterior hemisphere and lying medial to the optic nerve. There was serous detachment surrounding the tumor. The remainder of the physical examination was unremarkable. The complete blood count, SGOT, bilirubin, urinalysis, EKG, and x-ray films of the skull and chest were normal. A diagnosis of malignant melanoma was made and an enucleation of the left eye was performed. The pathologic diagnosis was malignant melanoma of mixed type without evidence of invasion beyond the eye or involvement of the optic nerve. Five days postoperatively the first TcSC liver–spleen study was done (Fig. 1A, B). It showed a mildly enlarged spleen which on posterior view was denser than the liver and measured 14.75 cm in its longitudinal dimension. The liver and amount of bone marrow uptake were normal. A repeat study was done 2 weeks later, 19 days postoperatively, and the increased splenic uptake on the posterior view was unchanged. The spleen now measured 14.0 cm. A followup study 78 days postoperatively was normal (Fig. 2C, D). In particular, on the posterior view the spleen was less dense than the liver and measured 12.5 cm. Alkaline phosphatase determinations 36 and 78 days postoperatively were normal. The patient has been asymptomatic since his operation.

DISCUSSION

The resolution of increased splenic size and uptake of TcSC following the removal of a malignant melanoma suggests that the findings were secondary to the tumor. Goldman, et al reported a 34% incidence of increased splenic uptake of TcSC in patients with malignant melanoma and no evidence of liver disease but they did not describe any instance of resolution following removal of the tumor (*5*). Spencer, et al have reported a marked reduction in splenic size in a patient with metastatic Wilms' tumor to the liver following hepatic irradiation (*6*). However, in this patient the change in splenic size was probably partially or totally secondary to relief of portal hypertension. Increased splenic size without evidence of neoplastic involvement of the spleen or liver has also been reported in Hodgkin's disease (*7*) and other carcinomas (*8*).

A number of investigators have shown that malignant melanoma can incite a cellular immune re-

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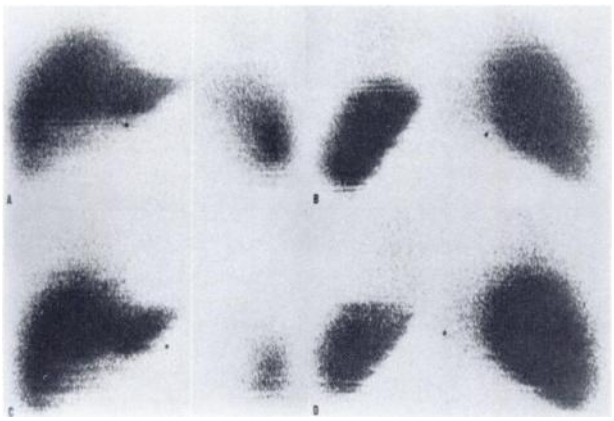

FIG. 1. (A, B) Anterior and posterior scans from ^{99m}Tc-sulfur colloid liver–spleen study showing increased splenic size and uptake in patient who had ocular malignant melanoma removed 5 days previously. (C, D) Anterior and posterior scans from followup study 78 days postoperatively showing resolution of increased splenic size and uptake.

sponse (*1–4*). Macrophages play an important role in the cellular immune response to cancer in general (*9–11*) and malignant melanoma in particular (*12,13*). Under most conditions macrophages originate in the bone marrow from promonocytes, circulate in the blood as monocytes with a half-time of 22 hr, and then become fixed in the liver, spleen, and lungs (alveolar macrophages) or enter the serous cavities such as the peritoneum (*14*). Once fixed in the tissues, the macrophages turn over slowly with a half-time of 10–30 days (*14*). Increased splenic uptake of TcSC may be explained by the fact that tumors cause an increased production of macrophages by the bone marrow (*15*) and that activated macrophages migrate to the spleen to a greater extent than nonactivated macrophages (*16*).

Although the above explanation accounts for the initial findings of increased splenic size and uptake of TcSC, other explanations are possible. Resolution of increased splenic size and uptake following removal of the malignant melanoma may reflect a significant reduction in tumor burden but not necessarily the absence of viable tumor cells. Possible prognostic implications will require further study.

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