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Scintigraphic Evaluation of the Liver in *Fasciola hepatica* with Radiocolloid and ^{67}Ga-Citrate

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Abstract. A group of 23 patients with *Fasciola hepatica* have been studied in the province of Biscay. The diagnosis was reached after finding parasite eggs in the faeces or duodenal juice. The liver lesion was confirmed by means of macro and microscopic studies. Radiocolloid demonstrated the presence of cold areas in 18 patients; in 13 of them the uptake with ^{67}Ga was positive. These isotopic findings identified *Fasciola hepatica* as one of the causes of 'cold areas' in traditional liver scans and positive ^{67}Ga uptake.

Introduction

A ^{67}Ga liver scan is considered positive if a cold region on traditional scan (^{99}Tc^{m} or ^{198}Au) shows increased or equivalent intensity on the ^{67}Ga scan when compared with the adjacent hepatic tissue. A positive ^{67}Ga liver scan has been reported in neoplastic and inflammatory liver diseases [2, 8, 10]. We do not know if studies of liver scans comparing the behaviour of traditional radiocolloid and ^{67}Ga in patients with *Fasciola hepatica* have been reported [6, 9].

Patients and Results

During the period 1977–1979 in the province of Biscay, 23 patients with *Fasciola hepatica* were followed up (18 in the acute invasive phase of the disease and 5 in the chronic or latent phase). Alterations in the liver during the migration of the young parasite correspond to the acute phase; the chronic or latent phase of the disease sets in when the parenchymatous process subsides owing to healing and the parasites are in the biliary channels. The diagnosis was established after the parasite eggs were found in the faeces or in the duodenal juice. Liver disease was confirmed in all patients by endoscopy and biopsy.

In all 23 patients an isotopic liver scan was carried out using a linear scanner of 5″. After the liver scans with traditional radiocolloid, gallium scans were carried out 48–72 h after the i. v. administration of 25 μCi/kg of ^{67}Ga-citrate. The results are shown in Table 1.

Table 1

Patients Studied: 23 → 18: Acute phase; 5: Chronic phase

Radiocolloid scan	*^{67}Ga Scan*
Cold areas	Positive captation
Definitive: 18	Definitive: 13
16: Acute phase	13: Acute phase
2: Chronic phase	0: Chronic phase
Absent: 5	Absent: 10
2: Acute phase	5: Acute phase
3: Chronic phase	5: Chronic phase

Discussion

Liver scanning with radiocolloid preparations is firmly established in the study of patients with liver disease, which has been aided by the development of ^{67}Ga-citrate scanning.

We studied 23 patients with *Fasciola hepatica* in whom a macro and microscopic lesion in the liver had previously been demonstrated. There are only a few references on isotopic findings with radiocolloid in patients affected by *Fasciola hepatica* and none of them deal with the use of ^{67}Ga [1, 5, 12]. In our patients the study with radiocolloid showed in 78% of the scans a cold area in the liver, mainly of lower localization (Fig. 1a). This group was studied later with ^{67}Ga. Positive uptake was demonstrated in 13 of 18 patients with cold areas in radiocolloid scan (Fig. 1b). None of the patients with a ^{67}Ga positive scan had normal radiocolloid scan and not one of the five patients in the chronic phase had a ^{67}Ga positive scan. In 72% of patients in the acute invasive phase ^{67}Ga uptake was positive, and in 88.8% could areas with radiocolloid scan were found. It is possible that the degree of hepatic damage in the acute period

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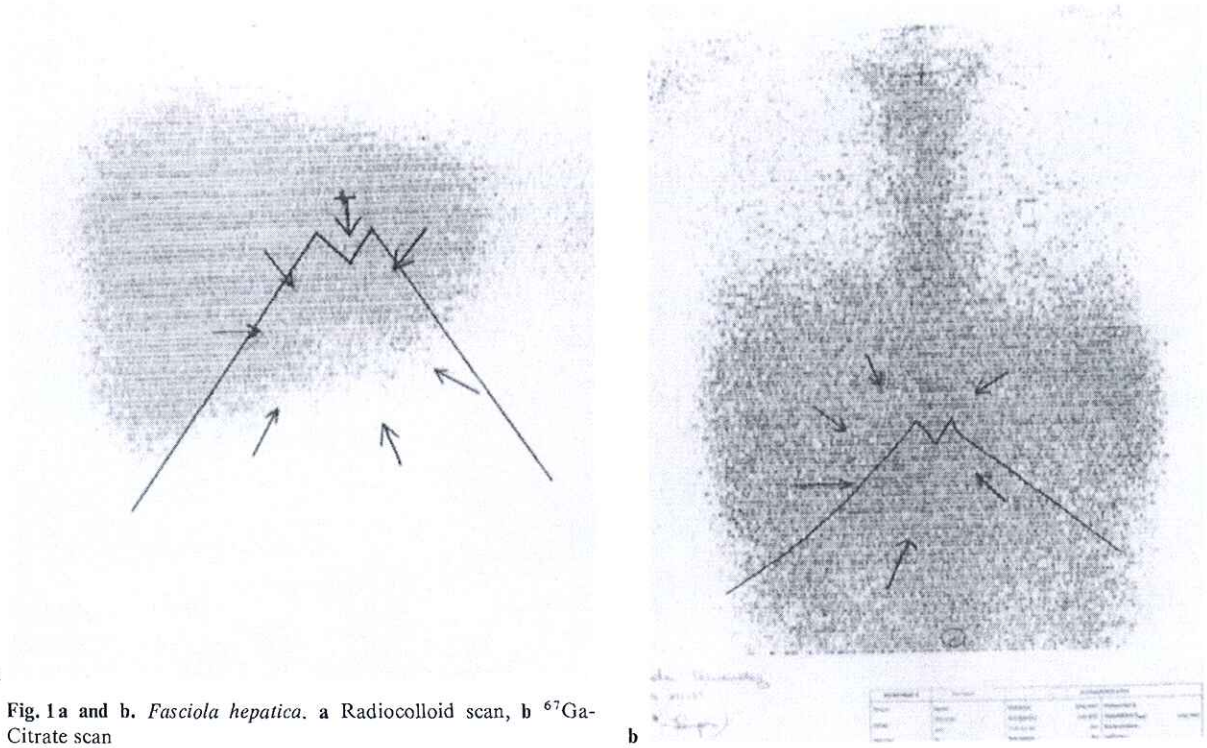

Fig. 1 a and b. *Fasciola hepatica.* **a** Radiocolloid scan, **b** ^{67}Ga-Citrate scan

of invasion and the extension of the lesion could explain the differences between the acute and chronic phases of the disease. During the invasion phase the biopsy findings in our patients were necrosis of hepatic cells with cellular infiltration of neutrophils, eosinophils and lymphocytes; in the chronic phase all of these findings were only occasionally present. We have not seen differences in the biopsy findings in the acute invasion phase between patients with positive and negative ^{67}Ga scans. However, the mechanism whereby ^{67}Ga is localized has not yet been definitely established. Experimental studies have suggested four possibilities for the mechanism of ^{67}Ga localization in inflammatory tissues, although the majority of gallium localization takes place because of leucocyte labelling and migration to the inflammatory area [3, 4, 11].

We think that these findings deserve some consideration. These lesions produced by *Fasciola hepatica* must be included as one of the causes of a single area of decreased uptake in the radiocolloid hepatic image, mainly if later studies with ^{67}Ga demonstrate positive uptake in those areas. The difference between 100% positive findings with endoscopy and biopsy compared with radio-isotopes is related to the extension of the lesion, evolutive phases of the disease, and the different mechanisms of uptake of the radioisotopes [7].

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