Amoebic Abscess of the Liver

SCANNING AND SELECTIVE HEPATIC ARTERIOGRAPHY

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SUMMARY

Selective angiography of the coeliac axis usually with superior mesenteric arteriography and hepatic isotopic scanning, have proved helpful in the diagnosis and differential diagnosis of amoebic liver abscess.

In 16 patients who have had selective angiograms, arteriography showed tumours in 13, failed in 1 and was doubtful in 2. Isotopic scanning demonstrated tumours in 10, failed in 3 and was doubtful in 3.

The results obtained with these 2 methods were confirmed by clinical, haematological, surgical, laparoscopic, postmortem, and therapeutic data.

After treatment the selective arteriography was repeated in 12 patients and isotopic scanning in 9. Both methods showed agreement in demonstrating the disappearance of the abscess in all patients except one. In this one the isotopic scanning image persisted, whereas arteriography no longer showed the existence of a tumour.

Arteriography and scintigraphy are complementary techniques for the diagnosis of tumours of the liver, the former being particularly useful for the aetiological diagnosis of the lesion.

S. Afr. Med. J., **48**, 96 (1974).

Isotopic scanning and selective hepatic arteriography are the most precise clinical methods used for the diagnosis of lesions in the liver parenchyma. The main indications for these 2 methods are the detection of lesions such as tumours, both primary and secondary, abscesses, cysts, and vascular malformations.[1,2]

Amoebic abscess of the liver, a fairly common condition in tropical countries, sometimes poses a diagnostic problem, and in particular that of the differential diagnosis between primary tumour of the liver and hepatic fibrosis of giant nodules. Besides, an amoebic abscess of the liver may coexist with any of these conditions.[3]

Hepatic isotopic scanning and selective arteriography of the liver have been used to establish a diagnosis and follow the evolution of amoebic abscesses of the liver.[4-6]

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Date received: 30 July 1973.

We have attempted a comparative study of the accuracy of both methods for diagnosis, and for the study of evolution, of amoebic abscess of the liver in a series of 20 patients.

PATIENTS AND MATERIALS

Twenty patients with amoebic abscess of the liver were submitted to clinical, radiological, parasitological, haematological, and isotopic scanning with rose bengal, selective arteriographic examinations, and liver function tests.

Rose bengal ^{131}I was used in a single intravenous dose of 150 μCi. Because rose bengal ^{131}I is fixed in the hepatic cells and quickly excreted into the intestine, scanning was started 15 min after injection of the tracer, moving from the lower to the upper border to avoid intestinal activity.

The machine used was the transistorised Picker Magnascanner III with colour printing diapositive No. 2655 A. This diapositive permits a direct semiquantitative analysis of the activity in the organ. Scanning was performed with the patient supine in an anteroposterior position. The scanning speed was set at 30 cm/min.[7]

The selective hepatic arteriography was performed in all cases, using Seldinger's technique of percutaneous puncture of either the right or the left femoral artery. The green catheter was used. The radiopaque contrast Urovision 74% was employed and injected by hand in

Fig. 1. Coeliac arteriogram after the scan shows a marked stretching and draping effect of the branches leading to the lower half of the right lobe.

amounts of 20 - 30 ml. The coeliac axis and the superior mesenteric artery were catheterised as a routine.

The diagnosis of amoebic abscess of the liver was confirmed in all cases by the outpouring of 'anchovy sauce' pus through a puncture needle. The isotopic scanning and hepatic arteriography were performed on admission. The patient was given conservative medical treatment—chloroquine, emetine, and aspiration. As soon as nothing was aspirated the isotopic scanning and the selective arteriography were repeated to confirm the disappearance of the abscess and the cure of the lesion. A few cases who were resistant to treatment were submitted to more than one examination.

The results of arteriography and isotopic scanning were checked by objective data obtained by postmortem examination, surgery, laparoscopy and therapy.

Fig. 2. The capillary phase shows a demarcated zone of radiolucency with a rim of increased density, producing a halo effect.

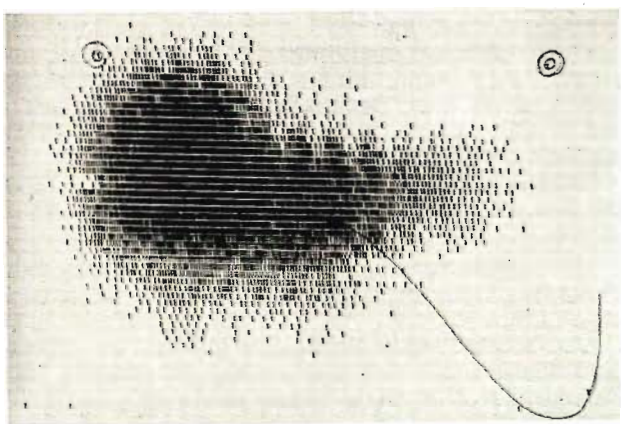

Fig. 3. Liver scan appears normal and it is difficult to assess the effect in the lower half of the right lobe.

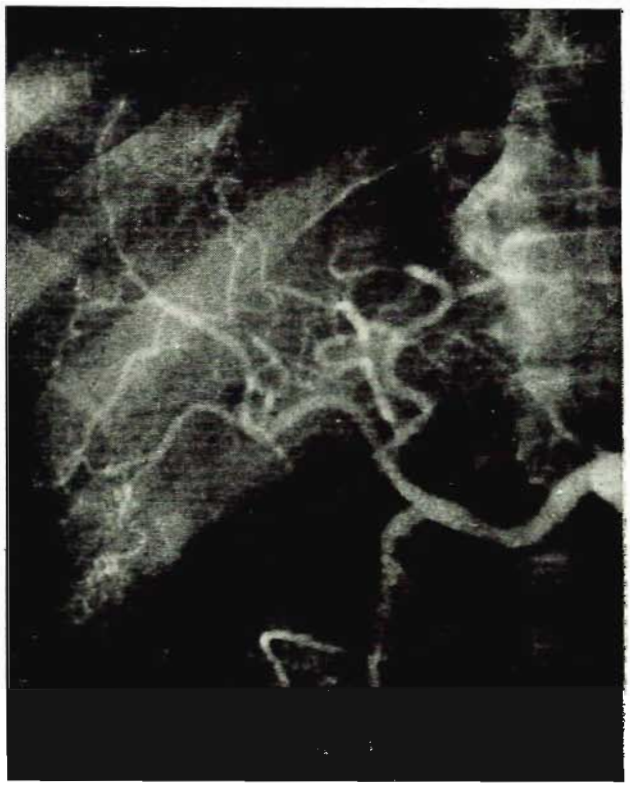

Fig. 4. Post-treatment coeliac angiography demonstrates the disappearance of the cavity of the abscess and an increased vascularity in the region of the abscess.

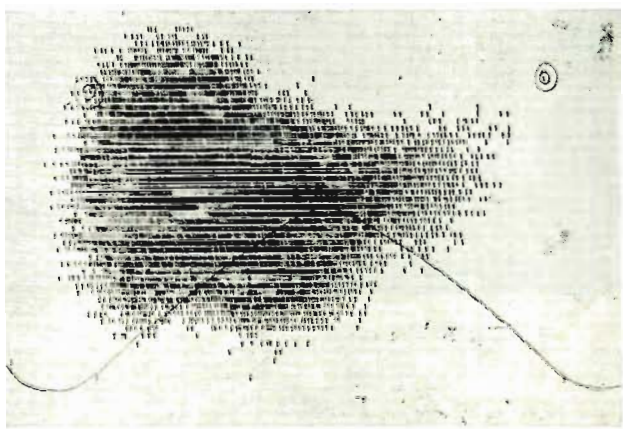

Fig. 5. Post-treatment scanning image is different, suggesting retrospectively the existence of an abscess at the lower half of the right lobe.

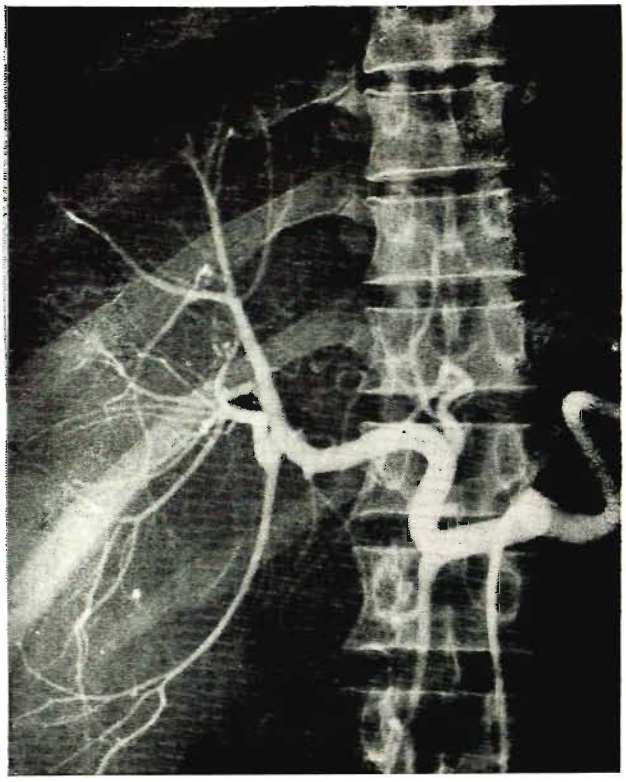

Fig. 6. Coeliac arteriography—the hepatic artery branches are stretched around an avascular tumour.

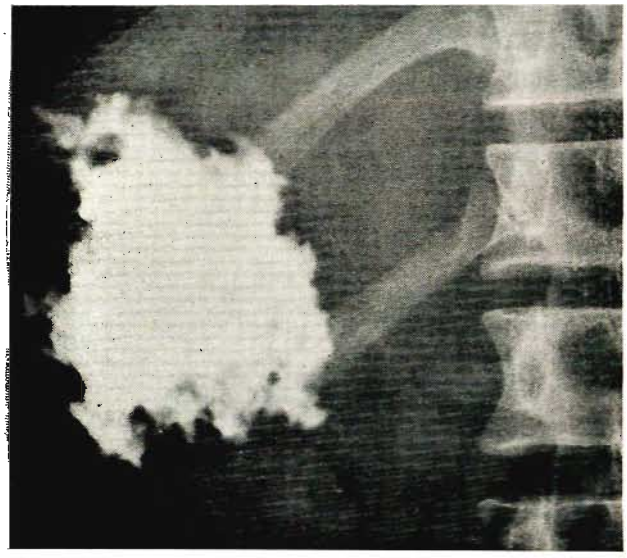

Fig. 7. The cavity of abscess opacified.

RESULTS

Of the 20 patients studied, 16 were submitted to isotopic scanning. This showed morphological and topographical changes with enlargement of the liver in all cases, a lesion being evident in 11 cases, absent in 2, and doubtful in 3. Isotopic scanning failed to show lesions in 2 cases in whom amoebic abscess of the liver was absolutely confirmed, but on the other hand it showed a lesion in 1 case of amoebic hepatitis.

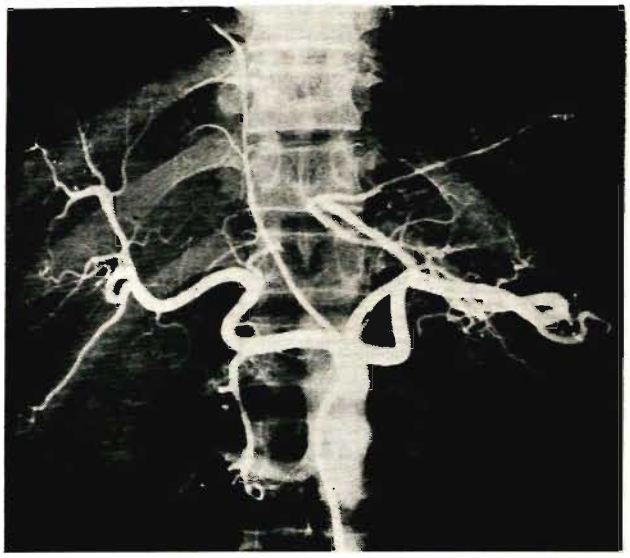

Fig. 8. Post-treatment coeliac angiogram showing normal hepatic arterial vascularisation.

In the 20 patients studied, 1 aortography and 19 selective arteriographies were performed. Selective hepatic arteriography always gave a constant and characteristic aspect in the 2 phases of the arteriogram and hepatogram. In the arterial phase there was a vascular displacement in which the main arteries appeared stretched and the branches of the hepatic artery appeared thin, elongated, outlining avascular areas, and arranged as though surrounding the cavity of the abscess. In the hepatogram the size of the abscess was demonstrated by the different radiolucency of that area compared with that of the normal liver parenchyma.

Selective hepatic arteriography gave the diagnosis of liver abscess in 15 cases, of extrahepatic abscess in 1 case, failed in 1, and was doubtful in 2.

Aortography was performed in 1 patient in a poor general condition and with a toxic megacolon and amoebic abscess of the liver. The results obtained by this method and in this situation, did not allow the drawing of any conclusion. The patient died a few hours later.

Selective hepatic arteriography was informative about the site of lesions in cases with an abscess, but did not show any change in a case of amoebic hepatitis.

Both isotopic scanning and selective arteriography failed to demonstrate a small abscess in the tip of the left lobe of the liver.

After medical treatment, isotopic scanning was repeated in 9 patients and selective arteriography in 12. Both methods agreed in demonstrating cure and disappearance of the abscess in all cases but 1. In this one the isotopic scanning showed an existing lesion which was not confirmed by arteriography.

The results and the conclusion are shown in Table I.

TABLE I. COMPARATIVE RESULTS OF SCINTIGRAPHY AND ARTERIOGRAPHY BEFORE AND AFTER TREATMENT

	Before treatment		Post-treatment	
Cases	Scanning	Arteriography	Scanning	Arteriography
1	Negative	Positive	No alteration	No alteration
2	Positive	Positive	No alteration	No alteration
3	Negative	Negative	*	*
4	Positive	Positive	Dead	
5	Doubtful	Positive	Dead	
6	Positive	Positive	*	*
7	Positive	Positive	No alteration	No alteration
8	Doubtful	Positive	No alteration	No alteration
9	Positive	Positive	Doubtful	Doubtful
10	Positive	Positive	*	*
11	Positive	Positive	*	*
12	*	Negative	Extrahepatic abscess	
13	Positive	Positive	No alteration	No alteration
14	Positive	Positive	No alteration	No alteration
15	Positive	Positive	No alteration	No alteration
16	Positive	Negative	Amoebic hepatitis	
17	*	Positive	*	*
18	Positive	Positive	No alteration	No alteration
19	*	Negative	*	*
20	*	Positive	Dead	

* Scintigraphy and arteriography were not performed.

DISCUSSION

Isotopic scanning of the liver is a simple and cheap method, well tolerated by patients and free of secondary effects. It has been regarded by some authors as a highly informative method for the diagnosis and study of the evolution of certain lesions of the liver.[8] However, its interpretation, even when obtained in anteroposterior and lateral positions, is difficult on account of the great variety of normal scans of the liver, but also as a result of the conditions which need to be fulfilled: the size of the lesion, the volume of the liver in which the lesion lies, and the depth of the lesion.[9,10]

Lesions in the left border and left lobe of the liver, and in the gall bladder and cardiac areas, may not be differentiated by isotopic scanning. On the other hand, in generalised diseases of the liver parenchyma, such as macronodular cirrhosis and amoebic hepatitis, there may present a scanning image of a lesion.[11-14] Coexisting lesions such as liver abscess and primary tumour of the liver, or liver abscess and macronodular cirrhosis, may fail to be diagnosed by isotopic scanning.[3,18]

The nature of the lesion is never identified[10,16] by isotopic scanning, notwithstanding some authors' claims to distinguish between the scanning images of tumours and abscesses of the liver;[6] such differences do not exist and, even if they did, they would be very difficult to establish because the scanning images are absolutely identical, which does not happen with arteriography.

The accuracy of liver scanning has been reported to be 77%,[16] but lesions less than 2 or 3 cm in diameter are not demonstrable,[15,17] and the frequency of false positive interpretations has been reported as 2,5 - 17%.[5,18] According to Kreel[16] rose bengal ^{131}I is one of the radiocolloids that produces a greater number of artefacts in the scanning image, and it should be replaced by ^{198}Au or technetium for the detection of lesions.

Hepatic angiography has become one of the most reliable methods for diagnosis for the study of the evolution and the differential diagnosis of diseases of the liver. Its limitations, like those of isotopic scanning, include the difficulty of demonstrating lesions with a diameter less than 2 cm located in the left lobe, or small lesions occurring in a cirrhotic liver. However, in some medical centres direct serial magnifying techniques for small foci are already being applied in hepatic angiography, thus showing up *in vivo* blood vessels with a diameter of about 100 μm.[24]

The accuracy of hepatic angiography in mass lesions has been reported as 70 - 92% and, as with isotopic scanning, the accuracy increases when lateral and oblique views are taken as well.[15,19]

The arteriographic image of the intrahepatic arterial vessels in cases of mass lesions is so suggestive that in most cases it enables a diagnosis of benign or malignant lesion to be made as well as demonstrating both lesions when coexistent.[2] The main sign is the vascular displacement in which the intrahepatic arteries generally form a smooth curve outlining the bare areas that occur with cysts and abscesses.[20,21] Opposed to these signs are those of a malignant lesion in which vascular displacement is accompanied by a 'malignant circulation', with the typical 'blush' that occurs in hepatomas and metastatic deposits.[2,21,22]

Selective arteriography is a method with a low but definite morbidity[18] requiring a delicate technique. However, serious complications can now be kept as low as 0,5%.[23]

In the same series of patients submitted to arteriographic examination and isotopic hepatic scanning, the number of correctly diagnosed lesions was higher for selective arteriography than for isotopic scanning. Arteriography made possible the diagnosis of 13 cases of abscess, failed in 1 and was doubtful in 2; scanning made the diagnosis possible in 10, failed in 3 and was doubtful in 3.

The accuracy of the arteriographic and isotopic methods of detecting amoebic abscesses of the liver is about the same, but there are advantages for arteriography in that it can diagnose the nature of the lesion, and enables the progress of the condition to be followed.

REFERENCES

1. Chavez, C. M. (1967): Surgery, **61**, 634.
2. McAfee, J. G., Ause, R. G. and Wagner, H. N. (1965): Arch. Intern. Med., **116**, 95.
3. Viana, R. L. Personal observation.
4. Czerniak, P., Luban, E. and Djaldetti, M. (1963): J. Nucl. Med., **4**, 35.
5. Ibraham, M. S. and Abel-Wahab, M. F. (1963): Brit. Med. J., **1**, 1325.
6. Tandon, B. N., Roy Choudhury, A. K. and Tikare, S. K. (1966): Amer. J. Trop. Med. Hyg., **15**, 16.
7. Pedroso de Lima, J. J., Rego, A. S. and Ruas, A. (1967): Ann. Trop. Med. Parasit., **61**, 360.
8. Marberg, K. and Czerniak, P. (1964): Ann. Intern. Med., **60**, 66.
9. Hitzelberger, A. L. (1967): Gastrointest. Endosc., **13**, 12.
10. Kreel, L. (1969): Arch. Gastroent., **6**, 209.

11. Cohen, M. B. (1969): Radiology, **93**, 1139.
12. Johnson, P. M. and Sweney, W. A. (1967): J. Nucl. Med., **8**, 451.
13. Klion, F. M. and Rudawsky, A. Z. (1968): Ann. Intern. Med., **69**, 283.
14. Wagner, H. W. jun., McAfee, J. C. and Mozley, J. M. (1961): Arch. Intern. Med., **107**, 423.
15. Nebesar, R. A., Pollard, J. J. and Stone, D. L. (1966): Radiology, **86**, 284.
16. Kreel, L. (1969): Arch. Gastroent., **6**, 7.
17. Bonte, F. J., Krohmer, J. S. and Elmendorf, E. (1962): Amer. J. Roentgenol., **88**, 275.
18. Pollard, J. J. and Nebesar, R. A. (1968): New Engl. J. Med., **279**, pp. 20, 1093.
19. Evans, J. A. (1965): Radiol. Clin. N. Amer., **3**, 567.
20. Alfidi, R. J., Rastogi, H. and Buonocore, E. (1968): Radiology, **90**, 1136.
21. Pollard, J. J. and Nebesar, R. A. (1968): New Engl. J. Med., **279**, pp. 19, 1035.
22. Kreel, L. (1969): Arch. Gastroent., **6**, 93.
23. Lang, E. K. (1967): Radiology, **88**, 950.
24. Baum, S. (1969): Amer. J. Gastroent., **51**, 151.