Scientific Research Publishing

Open Journal of Medical Imaging, 2024, 14, 79-85
https://www.scirp.org/journal/ojmi
ISSN Online: 2164-2796
ISSN Print: 2164-2788

Contribution of Imagery in the Diagnosis of Multisystemic Sarcoidosis in the Service Radiology Department of the Mother and Child Hospital "Le Luxembourg" in Bamako: A Case Report

Mariko Mahamane[1], Camara Mamoudou[2*], Keita Aboubacar Sidiki[3], N'Diaye Mahamadou[4], Camara Mody Abdoulaye[5], Fofana Youssouf[1], Traoré Mohamed Maba[5], Sidibé Siaka[6], Sanogo Souleymane[1], Keita Adama Diaman[6]

[1]Department of Radiology, Mother and Child Hospital Luxembourg, Bamako, Mali
[2]Medical Imaging, Exploration and Diagnostic Center, Conakry, Guinea
[3]Assistant at the Faculty of Health Sciences and Techniques at the Gamal Abdel Nasser University of Conakry
[4]Department of Radiology, Military Hospital of Bamako, Bamako, Mali
[5]Department of Radiology, Mali Hospital, Bamako, Mali
[6]Department of Radiology, Point G Hospital, Bamako, Mali
Email: *camaramamoudou97@gmail.com

How to cite this paper: Mahamane, M., Mamoudou, C., Sidiki, K.A., Mahamadou, N., Abdoulaye, C.M., Youssouf, F., Maba, T.M., Siaka, S., Souleymane, S. and Diaman, K.A. (2024) Contribution of Imagery in the Diagnosis of Multisystemic Sarcoidosis in the Service Radiology Department of the Mother and Child Hospital "Le Luxembourg" in Bamako: A Case Report. *Open Journal of Medical Imaging*, **14**, 79-85.
https://doi.org/10.4236/ojmi.2024.143008

Received: March 19, 2024
Accepted: July 29, 2024
Published: August 1, 2024

Abstract

The aim of this study was to report a case of multi-visceral sarcoidosis at the Mother-Child Hospital Center (CHME) "Le Luxembourg" in Bamako, Mali. **Observation:** This is a patient aged 62 at the time of consultation, a housewife, residing in the Banconi district, who was referred to us for thoracic-abdominopelvic imaging for chronic liver disease. After several diagnostic errors, the thoracic-abdominopelvic CT scan and liver MRI performed in our center showed, at the thoracoabdominal level, bilateral diffuse pulmonary micronodules and bilateral mediastinal-hilar lymphadenopathy; on the abdominal level, a dysmorphic liver with plaques of steatosis and a granular appearance of the liver parenchyma without periportal fibrosis. These imaging data combined with those from the liver nodule biopsy and biology confirmed the diagnosis of sarcoidosis type II. Treatment with corticosteroids gave satisfactory results and the patient recovered after 18 months. Clinical and CT monitoring 2 years from the start of the disease and 2 months from the end of treatment showed complete resolution of the lesions. **Conclusion:** The multi-visceral location of sarcoidosis is an entity whose diagnosis remains difficult; diagnostic and interventional imaging has an important place in its management.

Keywords

Sarcoidosis, Multi, Visceral, Imaging, CHME Luxembourg

1. Introduction

Sarcoidosis is a systemic disease of unknown cause characterized by the formation of immune granulomas in affected organs. The mediastinal-pulmonary sphere and the lymphatic system constitute the predilection sites of the disease [1] [2]. It affects young adults of both sexes between 25 and 45 years old. In 86% - 92% of cases, it causes mediastinal-pulmonary involvement. Ophthalmic, dermatological, peripheral lymph node and hematological disorders are encountered in 10% to 30% of cases [3]. The prevalence of the disease is estimated at 1 to 40 cases per 100,000 inhabitants [3]. It is difficult to determine precisely due to the latent nature of many disorders and the great variability of clinical presentation. The incidence varies according to sex, age, ethnicity and geographic origin. It is estimated at 15/100,000 in men and 22/100,000 in women [4]. A peak incidence occurs between the ages of 20 and 40 (70% of cases) [2]. A second peri-menopausal peak is observed after age 50 among women in Europe and Japan [3]. Sarcoidosis is rare before the age of 20 and after the age of 65. The incidence is four times higher among African Americans than among Caucasians [5]. The cause of sarcoidosis remains unknown. It is likely that one or more etiological factors of an infectious or environmental nature could trigger an exaggerated immune reaction in genetically predisposed individuals, thus creating a model of auto-inflammatory disease [6]. Its diagnosis is based on a combination of clinical, radiological, biological, immunopathological, and histopathological arguments and the exclusion of any other condition likely to resemble it [3]. Computed tomography (CT) is an essential examination of atypical manifestations of the disease to avoid any confusion with differential diagnoses and sometimes comorbidities [7].

The evolution is most often spontaneously favorable in less than two years. However, in a third of cases, respiratory complications develop which develop into pulmonary or extra-respiratory fibrosis which threatens the functional or even vital prognosis [6]. Corticosteroid therapy and various immunosuppressive treatments most often control granulomatous lesions and abnormal cytokine production. However, these treatments have a purely suspensive effect. They are ineffective on established fibrosis lesions [6].

The objective of this study was to present a case of multi-visceral sarcoidosis detected on CT after several diagnostic errors at the Mother-Child Hospital Center (CHME) "Le Luxembourg" in Bamako, Mali.

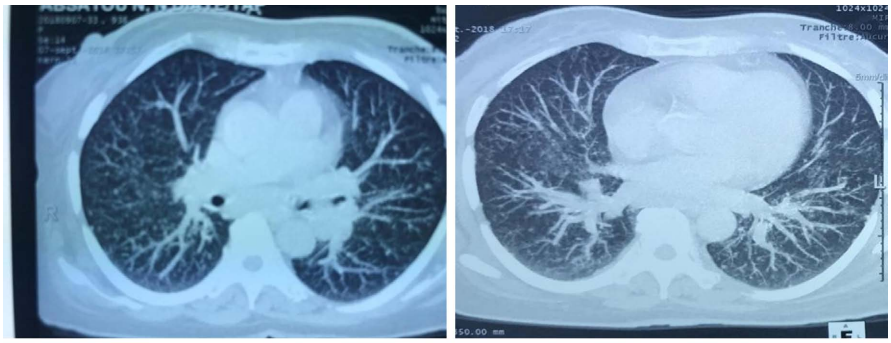
2. Observation

The patient was a 62-year-old multiparous housewife residing in the Banconi

district, referred for a thoracic-abdominopelvic scan to evaluate the lesions of chronic liver disease.

As a reminder, the patient had an abdominal CT scan, low-field magnetic resonance imaging (MRI) of the liver and liver biological tests on August 20 and 28, 2018. These radiological examinations (CT and MRI) established the diagnosis of hepatic cirrhosis with regenerative nodules and chronic liver disease. A series of biopsies in different health establishments in Bamako (**Figure 1**) and histopathological examination revealed hepatocellular carcinoma on cirrhotic liver.

Given the persistence of clinical signs of dyspnea, cough and fever of unknown origin and the lack of improvement under medications whose names are unknown, a thoraco-abdominal scanner was requested to evaluate the lesions previously described on August 20 and 28, 2018. Paraclinical examination, thoracic-abdominopelvic scanner (**Figures 1-3**) and Hepatic MRI (**Figure 4**) were carried out in the imaging department of the Mother-Child Hospital "Le Luxembourg" on September 10, 2018, using a 16-section HITACHI device, without and with injection of 100 ml of contrast product (Iomeron 350 mg), diffuse pulmonary micronodules were noted in the thoracic area in both pulmonary fields, mediastino-hilar lymphadenopathy; at the abdominopelvic level a dysmorphic liver



(a) (b)

Figure 1. Thoracic CT scans (axial parenchymal window maximum intensity projection) (a) and (b) multiple disseminated micronodules in both lung fields.

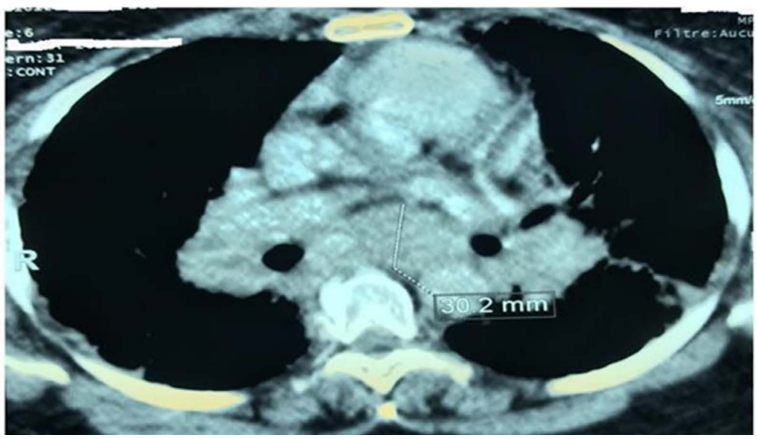
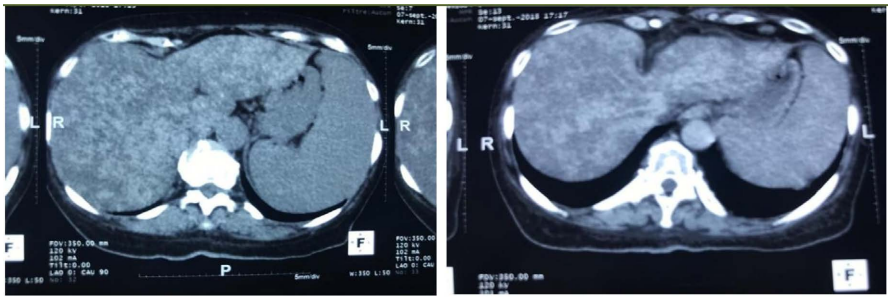
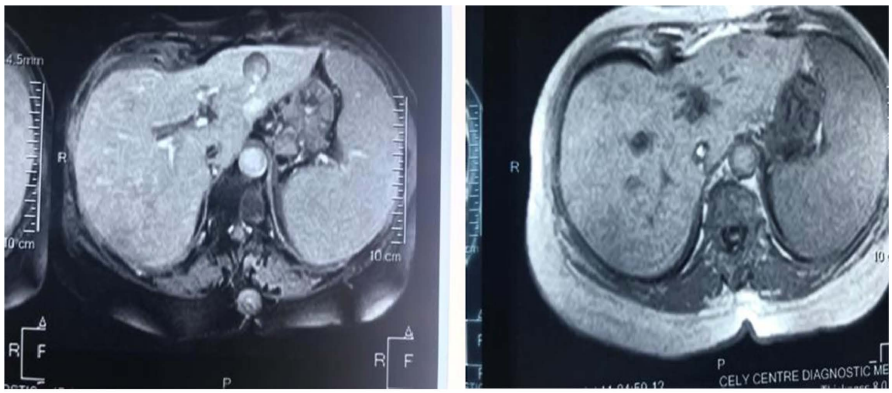


Figure 2. Thoracic CT scans (mediastinal window) bilateral hilar and subcarinal lymphadenopathies.



(a) (b)

Figure 3. Abdominal CT scans (axial) (a) without contrast injection, (b) after contrast injection, showing dysmorphic liver with areas of steatosis, micronodules, and splenomegaly.



(a) (b)

Figure 4. Hepatic MRI (out phase and in phase) showing a dysmorphic liver.

with plaques of steatosis and a granular appearance of the liver parenchyma without periportal fibrosis compatible with stage II sarcoidosis. This review disagreed with previous reviews. On biology, we noted hypercalcemia without underlying neoplasia. In the respiratory function test (EFR), we found an FEV of 3300 L or 106%, a Tiffeneau of 80%, a Total Lung Capacity (CPT) of 124%, a forced vital capacity FVC of 67% and a diffusion capacity carbon monoxide (DLCO) at 92% of the theoretical value. Bronchial fibroscopy with bronchoalveolar washing (BAL), including cytology in bronchoalveolar washing (BAL) could not be performed. However, the search for acid-fast bacilli (AFB) on direct examination, and the culture of Koch bacillus (BK) were negative in the bronchial aspirate fluid and in the BAL.

The coagulation profile was normal. Laboratory tests showed elevated angiotensin-converting enzyme levels to 210 U/L (20 - 70 U/L). The histology of biopsies of liver nodules with pieces sent to Senegal and France showed the presence of granulomas. These results were consistent with those of the imaging, therefore confirming stage II sarcoidosis, without signs of malignancy or mycobacterial infection or schistosomiasis.

Corticosteroid therapy was started and gave satisfactory results the week following the imaging. The starting dose was 1 mg/kg/day of prednisone equiva-

lent. The total treatment duration was 18 months. At the end of corticosteroid therapy, a complete remission of clinical signs was noted. The CT scan 2 years from the start of the disease, *i.e.* 2 months after the end of medical treatment, noted a resolution of the pulmonary and abdominopelvic lesions.

3. Discussion

Sarcoidosis is discovered at a variable stage, sometimes long after its actual onset. Its diagnosis is based on clinical, radiological and biological arguments and must be confirmed by the demonstration of tuberculoid granulomatous lesions from well-chosen biopsy samples [6]. In this observation, the diagnosis was suggested by CT scan and MRI in the face of diagnostic errors and a vague symptomatology evolving over eight months. It was confirmed by histology of biopsies of liver nodules, in a 65-year-old non-smoking patient with no occupational exposure. The diagnosis of sarcoidosis must make it possible to exclude any other condition likely to resemble it [3]. The thoracic-abdominopelvic CT scan showed diffuse pulmonary micronodules in both lung fields (**Figure 1**), mediastinal-hilar lymphadenopathy (**Figure 2**), associated with MRI, granulomatous hepatitis without peri-portal fibrosis (**Figure 3** and **Figure 4**) classified as stage II sarcoidosis. This same observation was found in the literature with the importance of imaging in the diagnosis of Sarcoidosis, also in the work of S. Louhaichi *et al.*, therefore the chest CT showed mediastinal lymphadenopathy in 87% of cases, its Mediastinal lymphadenopathy was isolated and associated with alveolar-interstitial opacities [8]. However, a significant elevation associated with clinical signs of multiorgan involvement is suggestive of Sarcoidosis. During sarcoidosis, 10% to 20% of patients have hypercalcemia [9]. The hypercalcemia found in our observation was without underlying neoplasia. Abnormalities in the respiratory function test (EFR) in particular with a forced vital capacity FVC less than 65% and a diffusion capacity of carbon monoxide (DLCO) less than 60% of the theoretical value take into account the indication for treatment [10] [11]. In our observation the EFR found an FEV1 at 3300 L or 106%, a Tiffeneau 80%, a Total Lung Capacity (TLC) at 124%, a forced vital capacity FVC at 67% and a DLCO at 92% of the theoretical value. Bronchial fibroscopy with bronchoalveolar washing (BAL), for which cytology in the BAL could not be performed. But the search for Acid-fast Bacilli (AFB) on direct examination, and the culture of Koch Bacillus (BK) were negative in the bronchial aspirate fluid and in the BAL. Oral corticosteroid therapy is the standard treatment for sarcoidosis; it aims to inhibit the granulomatous reaction in order to prevent or reduce the functional impairment of the affected organ. With a starting dose of between 0.5 to 1 mg/kg/day for a minimum duration of 12 months. Other lines of drug treatment are also used. Treatment can be started immediately or after a period of observation. The treatments stabilize or regress the lesions but do not influence the natural history of the disease. Therapeutic abstention is considered in the event of type I or II mediastino-pulmonary involvement and without any

other associated extra-pulmonary location. In our context, in addition to the pulmonary and mediastinal lesions, there were liver lesions, which is why she benefited from long-term corticosteroid therapy with a starting dose equal to 1 mg/kg/d equivalent of prednisone. The total treatment duration was 18 months. At the end of corticosteroid therapy, a complete remission of clinical signs was noted. Patients must be followed regularly for 2 years following diagnosis [3]. Stages I can be followed every 6 months. Patients in stages II, III or IV should initially be followed every 3 to 6 months. In our context, the scan control at 18 months of medical treatment noted a resolution of the pulmonary and abdominopelvic lesions.

4. Conclusion

Sarcoidosis is a systemic disease of unknown origin characterized by the formation of immune granulomas, most commonly affecting the lungs and lymphatic system, as well as other organs. The symptoms of sarcoidosis are nonspecific and can vary greatly depending on the organ involvement and disease progression. Multi-visceral localization of sarcoidosis constitutes a challenging entity, where diagnostic imaging and interventions play an important role in management. A multidisciplinary approach is necessary

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Newman, L.S., Rose, C.S. and Maier, L.A. (1997) Sarcoidosis. *New England Journal of Medicine*, **336**, 1224-1234. https://doi.org/10.1056/nejm199704243361706

[2] Nunes, H., Soler, P. and Valeyre, D. (2005) Pulmonary Sarcoidosis. *Allergy*, **60**, 565-582. https://doi.org/10.1111/j.1398-9995.2005.00778.x

[3] (1999) Statement on Sarcoidosis. Joint Statement of the American Thoracic Society (ATS), the European Respiratory Society (ERS) and the World Association of Sarcoidosis and Other Granulomatous Disorders (WASOG) adopted by the ATS Board of Directors and by the ERS Executive Committee, February 1999. *American Journal of Respiratory and Critical Care Medicine*, **160**, 736-755.

[4] Baughman, R.P., Teirstein, A.S., Judson, M.A., Rossman, M.D., Yeager, H., Bresnitz, E.A., *et al.* (2001) Clinical Characteristics of Patients in a Case Control Study of Sarcoidosis. *American Journal of Respiratory and Critical Care Medicine*, **164**, 1885-1889. https://doi.org/10.1164/ajrccm.164.10.2104046

[5] Rybicki, B.A., Major, M., Popovich, J., Maliank, M.J. and lannuzzi, M.C. (1997) Racial Differences in Sarcoidosis Incidence: A 5-Year Study in a Health Maintenance Organization. *American Journal of Epidemiology*, **145**, 234-241. https://doi.org/10.1093/oxfordjournals.aje.a009096

[6] Grutters, J.C., Pantelidis, P., Sato, H., *et al.* (2003) Analysis of IL6 of IL1A Gene Polymorphism in UK and Dutch witch Sarcoidosis Patients. *Sarcoidosis, Vasculitis and Diffuse Lung Diseases*, **30**, 20-27.

[7] Bernaudin, J., Uzunhan, Y., Kambouchner, M., Brillet, P., Soussan, M., Nunes, H., *et al.* (2014) Clinical Presentation of Sarcoidosis and Diagnostic Work-Up. *Seminars in Respiratory and Critical Care Medicine*, **35**, 336-351. https://doi.org/10.1055/s-0034-1381229

[8] Battesti, J.P., Bouillon, R., Georges, R., Meyrier, A., Paillard, F. and Valeyre, D. (1985) Resorptive versus Absorptive Hypercalciuria in Sarcoidosis: Correlations with 25-Hydroxy Vitamin D3 and 1, 25-Dihydroxy Vitamin D3 and Parameters of Disease Activity. *Quarterly Journal of Medicine*, **54**, 269-281.

[9] Valeyre, D., Chapelon-Abric, C., Belin, C. and Dumas, J.L. (1998) Sarcoïdose du système nerveux central. *La Revue de Médecine Interne*, **19**, 409-414. https://doi.org/10.1016/s0248-8663(98)80865-5

[10] Costabel, U. (1997) CD4/CD8 Ratios in Bronchoalveolar Lavage Fluid: Of Value for Diagnosing Sarcoidosis? *European Respiratory Journal*, **10**, 2699-2700. https://doi.org/10.1183/09031936.97.10122699

[11] Levinson, R.S., Metzger, L.F., Stanley, N.N., Kelsen, S.G., Altose, M.D., Cherniack, N.S., *et al.* (1977) Airway Function in Sarcoidosis. *The American Journal of Medicine*, **62**, 51-59. https://doi.org/10.1016/0002-9343(77)90349-7