CASE REPORT/CAS CLINIQUE

NOCARDIA BRAIN ABSCESS - CASE REPORT AND LITERATURE REVIEW

ABCES CEREBRAL A NOCARDIA - A PROPOS D'UN CAS ET REVUE DE LA LITTERATURE

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ABSTRACT

Background and purpose
Nocardia species is an aerobic soil-saprophyte bacterium, responsible for rare opportunistic infections, mainly reported in immunocompromised patients. Nocardia brain abscess accounts for 1 to 2% of cerebral abscess. Abscesses are mainly located in the brain stem. Prognosis is poor.

Methods
The authors report one biloculated cerebral abscess case located in the left cerebellar and occipital lobes. We describe clinical, radiological and bacteriological findings and management; we also a review literature on Nocardia cerebral abscess.

Case report
A 56 year old man who was immunosuppressed, presented with headache and cerebellar syndrome. Head Computerised Tomography showed an irregularly enhancing cystic lesion in the left cerebellar and occipital lobes. He underwent posterior fossa cranitomy and chemotherapy that included high doses of Sulfamethoxazole-Trimethoprim and cefotaxime as microbateriologic examination revealed norcardia asteroids. He was eventually discharged home.

Conclusion
Nocardiasis is a rare cause of cerebral abcess in Morocco. Effective management includes early surgery and treatment with appropriate antibiotics.

RESUME

Introduction
La Nocardiose est une infection à Nocardia qui est une bactérie tellurique responsable d'infections rares, principalement chez les immunodéprimés. L'abcès à Nocardia représente 1 à 2 % des abcès cérébraux. Le pronostic est mauvais.

Méthodes
Les auteurs rapportent un cas d'abcès cérébral multifocal à Nocardia en particulier dans l'hémisphère cérébelleux et le lobe occipital gauches, et décrivent avec une revue de la littérature les aspects cliniques, radiologiques, bactériologiques ainsi que les résultats thérapeutiques de cette infection.

Cas clinique
Patient de 56 ans présentant un faible déficit immunitaire a été admis pour des céphalées associées à un syndrome cérébelleux. Le diagnostic d'abcès à nocardia était bactériologique. L'acte opératoire a été complété par une antibiothérapie à base de trimethropime sulfamethoxasole. L'évolution était très favorable.

Conclusion
Malgré la rareté de la nocardiose au Maroc, l'abcès à nocardia doit être évoque devant toute collection purulente intracérébrale. Le bon pronostic est tributaire d'un traitement précoce à base d'antibiothérapie intraveineuse adaptée.

INTRODUCTION

Nocardiosis is a rare opportunistic infection caused by Nocardia gram-positive aerobic filamentous bacilli, presenting as pulmonary disease in more than 70 % of patients [2]. Dissemination of the disease may be manifest as brain abscess and soft tissue infections [1]. Brain abscess is the more common clinical manifestation of central nervous system infection. Cerebellar and spinal locations are uncommon [5]. Mortality is high especially in immunocompromised hosts [8]. Paucity of clinical and laboratory signs of infection and insidious manifestations makes diagnosis and management difficult [1, 5].

CASE REPORT

A 56 year old man was admitted to our institution with a 2 week history of headache and vomiting, dry non productive cough and low grade fever. He had a three day history of gait disturbance. The patient had pulmonary sarcoidosis for the last 6 months which it is under long-term steroids 40 mg/ day. The patient had been receiving steroids at 40mg daily for six months on account of pulmonary sarcoidosis. On physical examination, he was normotensive and body temperature was 38, 7°C. The patient was fully conscious with mild nuchal rigidity. Papilledema and venous dilatation were present on fundoscopy. Central nervous system examination revealed left kinetic cerebellar syndrome. Laboratory investigation revealed severe leucocytosis (WBC count: 16, 6 $1O^3$) with 94, 3% polymorph nuclear cells, 0, 4 % lymphocytes and elevated sedimentation rate of 60 mm / h. HBs ag antiHIV1-2 and ag anti HCV were negative. Chest, skull and paranasal sinus X-rays and urine analysis were also normal. Computerised Axial Tomography (CT) scan of the head (with and without contrast) showed an irregularly enhancing hypodense lesion in the left cerebellar and occipital lobes with a mass effect particularly in the cerebellar region (Figure 1). The lesion had lower intensity than the white matter with a contrast enhancing capsule. The lesion was surrounded by high signal density edema zone. The differential diagnosis considered included cerebral abcess and glioma.

A craniotomy was done in the left posterior cerebellar fossa, and thick green pus was aspirated. After 96 hours of aerobic culture of the sample revealed Norcardia species. The colonies were white coloured, rough and soft on sheepblood and sabouraud dextrose agar. Gram and modified Ziehl Nielson staining demonstrated numerous thin branching, filamentous and beaded microorganisms which were waekly gram positive and partially acid- fast. On pathologic examination of the surgical material with metherramine silver; neutrophils and filamentous microorganisms were observed, without any finding of malignancy. Growth of nocardia asteroids complex was confirmed by microscopy subculture on Loewenstein-Jensen media, paraffin baiting technique and biochemical tests. Blood cultures showed no growth after seven days of incubation.

Further definitive identification and susceptibility testing identified N. asteroids with susceptibility to timethoprim-sulfamethoxazole, amoxicilline-clavulinique acid, ciprofloxacine, amikacine, imipenam, and resistant to ampicilline, erithromycine, cefotaxime, chloramphenicol. Treatment was completed by antibiotic therapy with sulfadiazine and cefotaxine from eight weeks which resulted in an excellent outcome. After one month the following Head CT scan showed both regressed images of brain lesion (Figure 2).; a repeat scan taken one year later showed significant improvement (Figure 3).

DISCUSSION

In order of frequency, the most common pathogenic Nocardia species are N. asteroids, N. brasiliensis and N. Otitidiscaviarum. Others species of Nocaria sush as Nocaria farcinica have rarely been isolated from clinical specimens. Among the etiologic factors of systemic or cerebral Nocardiosis are malignancies, immunodeficiency states, iatrogenic immunosuppression following organ transplantation, diabetes mellitus, renal disease, collagen vascular diseases, alcoholism, tuberculosis, preceding operation, chronic lung disease, trauma or abnormal phagocytic activity [1, 2, 6]. Although CNS nocardiosis is usually a consequence of pulmonary infection no other focus of infection could be found in this patient. Pulmonary sarcoidosis treated by a long term steroids, was probably the predisposing cause in our patient; namely chronic lung disease and immunosuppression. Most of the patients have predisposing factors, but in 15% N.asteroid infection occurs without underlying illness [6].

The portals entry of N.Species is the respiratory tract, surgical or traumatic skin wounds. Nocardial organisms have tendency to disseminate hematogenously from the primary site of infection, usually the lungs, brain, kidney, joints, bones and eyes are frequently secondary sites of infection. Although hematogenous dissemination to the CNS is reported in 20-45% of all nocardial infections [2],CNS nocardiosis is a rare clinical entity, where diagnostic delay often leads to a fatal outcome [3, 8].

The infection can spread hematogenously and progress to a disseminated disease that is defined by the presence of two or more foci of nocardiosis.. An increasing number of cases are being reported in immunocompetent individuals without predisposing factors. Cerebral nocardiosis is an uncommon clinical entity, representing only 2% of all cerebral abscesses [5, 7]. As our case the cerebellar and spinal locations are uncommon [5]. Most common presentation is with evidence of progressively expanding intracerebral mass lesion which can be multiple or single [9]. Nocardial brain abscesses are often misdiagnosed as malignant brain tumours and a definitive diagnosis may not be possible without detecting bacteria from the lesion. Infection of the brain by nocardia is often insidious in onset, difficult to diagnose and treat successfully [8]. It was also associated with a high mortality rate, which has been considerably reduced with advent of the CT scan [4].

There was no difference in the mortality rates of immunocompromised and non immunocompromised patients treated before CT was available; since the advent of CT, however, the mortality rate has been significantly worse in immunocompromised patients (55 % VS 20 %, P (0.005) [7].

Nocardial brain abscesses are frequently solitary (54 %). The mortality rate in patients with multiple abcesses is twice of that among patients with solitary abscesses (66% vs.33 %). The mortality rate also rises if the diagnostic procedures are delayed or the detected microorganism is highly resistant to the current antibiotics [6].

Stereotactic aspiration or open craniotomy for radical excision is indicated for patients who worsen neurologically or show enlargement of the intracerebral lesion. In fact the mortality rate among patients undergoing craniotomy (24%) is less than half of that among patients undergoing aspiration or drainage alone (50%), and is also lower than that among patients undergoing nonoperative therapy (30%) [6].

Treatment consists of surgical management which includes abscess drainage and institution of appropriate antimicrobials after culture confirmation [8]. Cotrimoxazole remains the antibiotic of choice and duration of treatment varies from six weeks to one year because of the high relapse rates after apparent cure, and in the immunodeficiency states [4]. Amikacin, imepenem, minocycline, ciprofloxacin and third generation cephalosporines are second line agents. Although resistance is not widespread, National Committee for Clinical Laboratory Standards NCCLS (now clinical and laboratory standard institute CLSI) recommends drug sensitivity for refractory cases [8]. Carbapenems, aminoglycosides, and linezolid have been found to very effective in many clinical situations [4, 5, 8].

CONCLUSION

Nocardiosis is a clinical entity which should be kept in the differential diagnosis of any brain abscess, even in apparently immunocompetent patients. Once diagnosed, empirically based drug treatment and surgical intervention must be applied for achieving significant improvement.

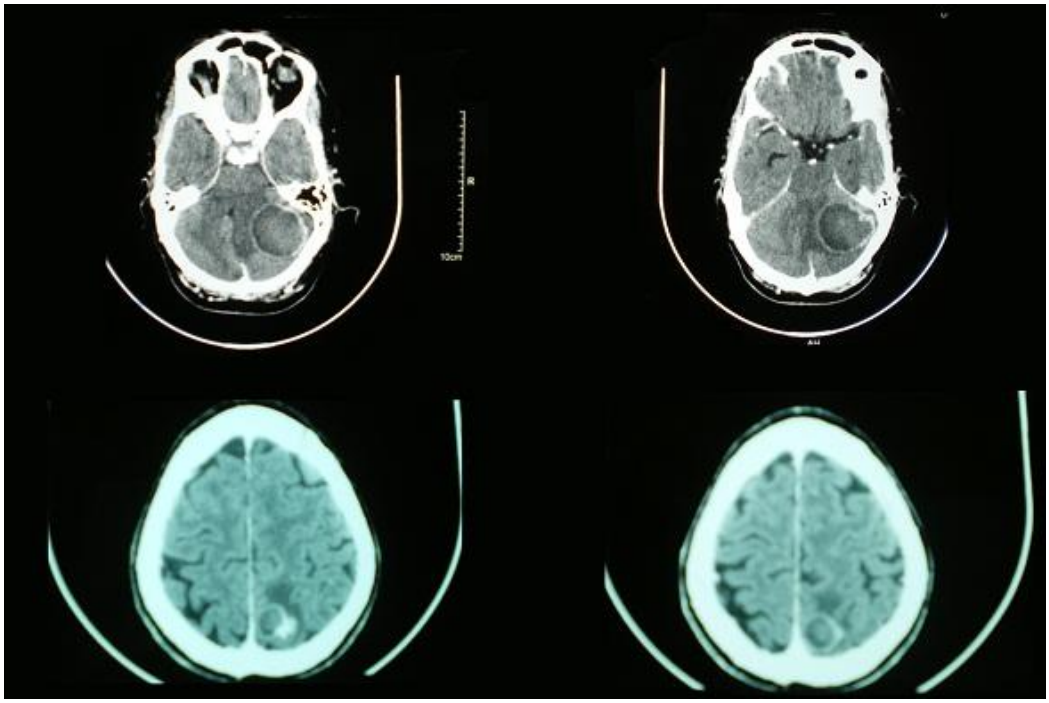

Figure 1
Axial CT scan image showed a both brain abscess in the left occipital and cerebellar lobes with a mass effect particularly in the cerebellar region.

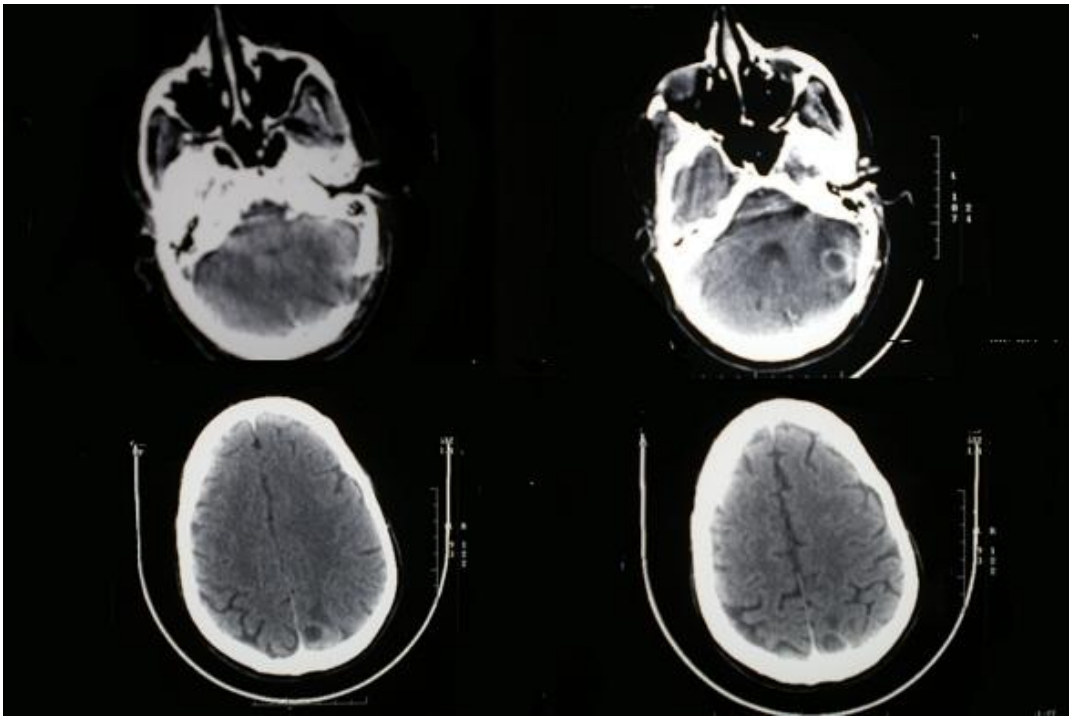

Figure 2
Axial CT scan taken one month later, showed a both regression of the brain abscess.

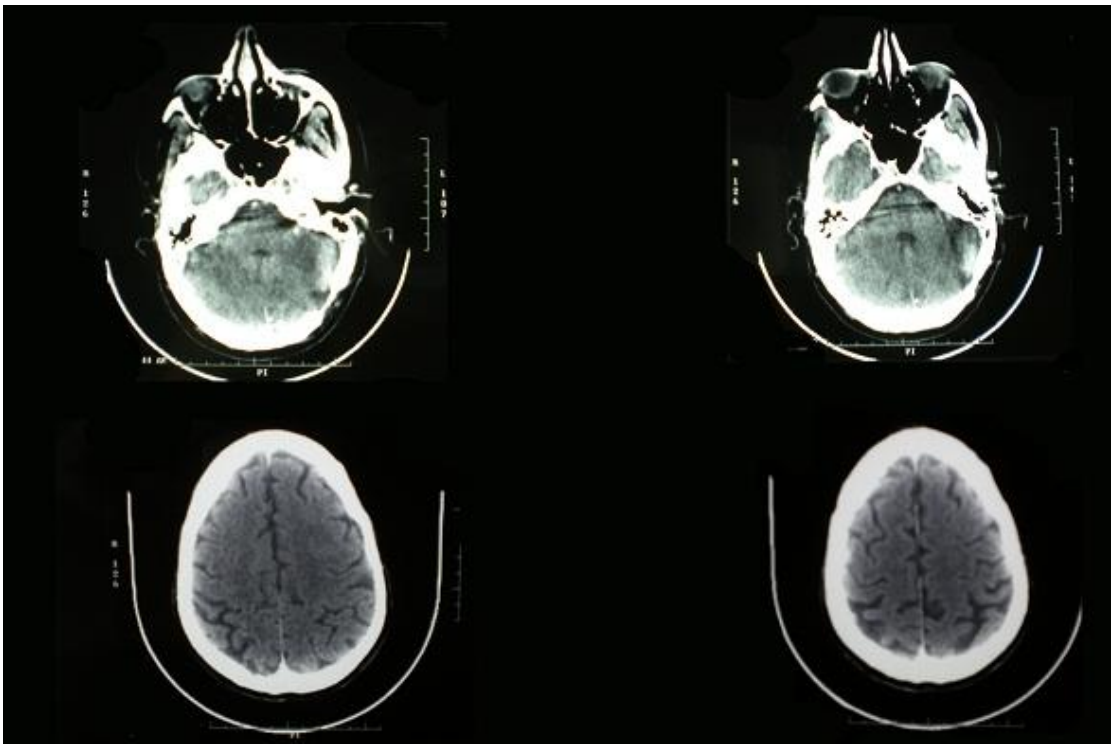

Figure 3
Axial CT scan taken one year later, showed significant improvement.

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