



Contents lists available at ScienceDirect

Journal of Infection and Public Health

journal homepage: <http://www.elsevier.com/locate/jiph>



Neurological disease may precede lymphadenopathies in *Actinomyces europaeus* infection

Silvia Corcione^{a,*}, Antonio Curtoni^b, Ivana A. Paolucci^c, Giovanni Di Perri^a,
Francesco G. De Rosa^{a,1}, Rossana Cavallo^{b,1}

^a Department of Medical Sciences, Infectious Diseases, University of Turin, Turin, Italy

^b Department of Public Health and Pediatrics, Microbiology and Virology Unit, University of Turin, Italy

^c Department of Clinical and Experimental Medicine, Unit of Infectious Diseases, University of Messina, Messina, Italy

ARTICLE INFO

Article history:

Received 9 October 2017

Accepted 7 December 2017

Keywords:

Actinomyces
Actinomycosis
Vascular infections
Intensive care unit
Vasculitis
Neurological symptoms

ABSTRACT

Actinomyces species are part of the commensal flora of the mucous membranes of the oropharynx, gastrointestinal tract and female genital tract. *Actinomyces europaeus* is a short, nonmotile, facultative anaerobic rod first described in 1997, susceptible in vitro to a wide range of b-lactam antibiotics which are regarded as first choice. In this report we described the case of *A. europaeus* infection in a young female patient admitted to Intensive Care Unit and the possible damage of vascular endothelium due to a chronic progressive actinomycosis that at first involved neck soft tissue, then cervical lymphnodes, and finally extended to the vascular structure.

© 2017 Published by Elsevier Limited on behalf of King Saud Bin Abdulaziz University for Health Sciences. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Dear Editor,

Actinomyces species are part of oral microbiome, commensal flora of gastrointestinal tract and genital tract in women. Actinomyces are human opportunistic pathogens and etiologic agents of actinomycosis in different districts such as the cervicofacial, thoracic, abdominal and also the pelvic areas in women [1].

First described in 1997, *Actinomyces europaeus* is a short, nonmotile, Gram positive rod, facultative anaerobic and susceptible in vitro to a wide range of b-lactam antibiotics which are regarded as first choice. Some *A. europaeus* have reduced susceptibility to tetracycline, ciprofloxacin, clindamycin, linezolid and piperacillin/tazobactam [2].

We report the case of a 21-year-old female admitted to our hospital on 8th February 2017 after the sudden onset of fever and headache followed by hemiparesis with seizures, requiring intubation and Intensive Care Unit support. Her recent medical history was only consistent with surgery for an ear tympanic or cutaneous abscess on January 2017, performed in another country without any discharge note available.

At time of admission, she was empirically treated with vancomycin and meropenem for a suspected post-surgical meningitis.

At physical examination, the patient had a left side hemiplegia and a tender, fluctuating collection was observed on the right auricle, with a suspicion of *fistula auris*: a swab was performed on a dense granulomatous secretion after compression and submitted to Microbiology laboratory for culture.

A cerebral computed tomography (CT) performed on February 9th revealed a right sagittal and transversus sinus thrombosis with subarachnoid hemorrhage in the right frontal lobe and a stenosis of the internal carotid artery. Because of a new episode of seizures, meropenem was discontinued after 3 days and ceftazidime was added to vancomycin.

On February 11th sedation was suspended and the patient showed dysarthria, left motor hemisindrome and an antalgic posture, with left head deviation. Blood culture were persistently negative, rectal swab was positive for carbapenemase producing *K. pneumoniae* and therapy was empirically de-escalated to trimethoprim/sulfamethoxazole (TMP/SMX).

For the persistence of the left head deviation and a right cervical lymphnodes with tenderness and stiffness of the right sterno-cleido mastoidien observed at the physical examination, on February 16th a CT scan was performed, showing right retroauricular and jugular lymph nodes, multiple bilateral cervical lymphadenopathy and a right side abscess in parotid region with some hypodensitive colliquative areas.

* Corresponding author.

E-mail address: silvia.corcione@unito.it (S. Corcione).

¹ These authors equally contributed to this work.

<https://doi.org/10.1016/j.jiph.2017.12.010>

1876-0341/© 2017 Published by Elsevier Limited on behalf of King Saud Bin Abdulaziz University for Health Sciences. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

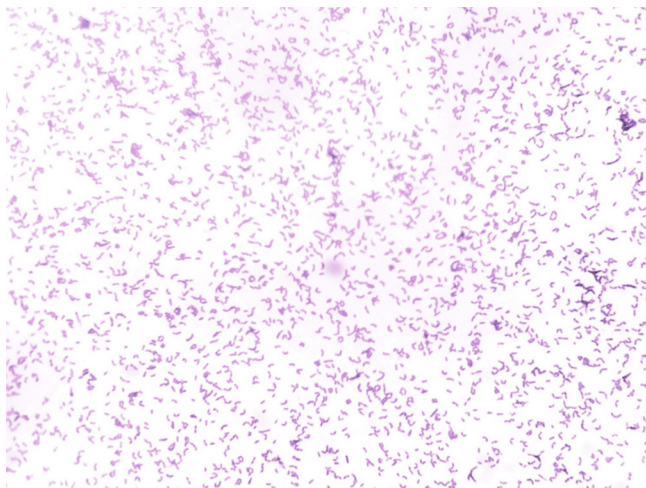


Fig. 1. *Actinomyces* spp. isolated from the right auricular fluctuating lesion.

Few days later, a Gram staining from small circular smooth grayish colonies grown on anaerobic culture media of *fistula auris* swab, revealed Gram positive rods (Fig. 1). A matrix-assisted laser desorption ionization time-of-flight mass spectrometry assay performed from isolated colony identified *A. europaeus* with a high degree of confidence. The isolate was tested for susceptibility with the following results: penicillin MIC 0.032 µg/mL; vancomycin MIC 0.25 µg/mL; clindamycin MIC >256 µg/mL and metronidazole MIC >256 µg/mL. Based on microbiological and radiological findings, TMP/SMX was stopped and a regimen with vancomycin plus ampicillin/sulbactam was started. The patient slightly improved with a reduction of the parotid abscess, lymphadenopathy and a stability of her neurological findings. At time of transfer to a long term care facilities, the infectious disease team recommended a 4 weeks therapy with ceftriaxone intravenously followed by oral amoxicillin for at least 5 months.

Actinomyces may be present as normal flora in the oral cavity and pharynx, and their most frequent presentation is an indolent, suppurative process, most commonly in the cervicofacial region. Our patient underwent drainage of tympanic abscess one month before the clinical onset, and the disruption of the mucosa might be the front door for the development of *Actinomyces* infection. In our case, vascular involvement by *Actinomyces* was hypothesized at the level of arterial and venous system. So far, only three cases in literature have been described as an adjacent vasculature extension from contiguous foci [1,3].

In this case, we might speculate that the damage of vascular endothelium might be due to a chronic progressive actinomycosis that at first involved neck soft tissue, then cervical lymph nodes, and finally extended to the vascular structure. In fact, in an autopsic report of a cerebral actinomycosis, the authors reported

an histological finding of vasculitis which was quite similar to that observed in polyarteritis nodosa. The cause of polyarteritis nodosa-like vascular changes is unknown, but immune mechanisms appear to be involved and *Actinomyces* might be one of the pathogenic agents of polyarteritis nodosa-like vascular changes, as previously reported for different bacterial agents [4,5].

In our case, *A. europaeus* was isolated from its normal niche as upper body site and it was fully susceptible to penicillin. Even though the patient was initially treated with an active therapy against *Actinomyces*, then she was stable and therapy was empirically switched to TMX/SMT. Our patient did not receive any empirical therapy covering actinomycosis for at least one week and this might have promoted the progression of infection.

In conclusion, actinomycosis is a rare, indolent and sometime aggressive infection and clinicians should be keep an high level of suspicion due to the very different range of clinical manifestations.

Consent, for the publication for this case report and any additional related information was taken from the patient involved in the study.

Funding

No funding sources.

Competing interests

None declared.

Ethical approval

Not required.

Authors contribution

SC, AC, FDR drafted the paper, SC, AC, IP collected clinical and microbiological data, SC, RC, FDR, GDP revised the paper.

References

- [1] Lezcano C, Simons JP, Colman KL, Cohen MS, Lin PL, Reyes-Mugica M. Actinomycotic mastoiditis complicated by sigmoid sinus thrombosis and labyrinthine fistula. *Pediatr Dev Pathol* 2014;17:478–81. <http://dx.doi.org/10.2350/14-05-1492-CR.1>.
- [2] Silva WA, Pinheiro AM, Jahns B, Bogli-Stubler K, Droz S, Zimmerli S. Breast abscess due to *Actinomyces europaeus*. *Infection* 2011;39:255–8.
- [3] Koda Y, Seto Y, Takeichi S, Kimura H. Fatal subarachnoid hemorrhage complicating actinomycotic meningitis. *Forensic Sci Int* 2003;134:169–71. <http://dx.doi.org/10.1016/j.nmni.2015.05.001>.
- [4] David J, Anselmi BM, Woo P. Polyarteritis nodosa associated with streptococcus. *Arch Dis Child* 1993;69:685–8. [http://dx.doi.org/10.1016/S0379-0738\(03\)00133-6](http://dx.doi.org/10.1016/S0379-0738(03)00133-6).
- [5] O'Sullivan J, Maurer B, Towers RP. *Staphylococcus aureus* septicaemia: the initial presentation of polyarteritis nodosa. *Br J Rheumatol* 1989;28:347–9.