

Endocarditis and meningitis associated to nape piercing in a young female: a case report

Endocardite e meningite associate a piercing della nuca in una giovane donna: un caso clinico

Andrea Mariano, Raffaella Pisapia, Amina Abdeddaim, Chiara Taibi, Alessia Rianda, Laura Vincenzi, Gianpiero D'Offizi

Hepatology Unit, National Institute for Infectious Diseases "L. Spallanzani", Rome, Italy

■ INTRODUCTION

The practice of body piercing and tattooing is increasing among young people, most of whom are unaware of the potential risks associated with these procedures. Piercing may be associated with a wide spectrum of complication, ranging from local reactions to severe infections with septicaemia. In literature, viral hepatitis B and C, toxic shock syndrome, osteomyelitis, endocarditis and brain abscesses have been described. Complications arising from these practices depend on many factors, including the site of the piercing, the material used, the tattooist's or piercer's skill, the procedure sterility, and the carefulness of local hygiene of the body area involved [1-5]. Among the bacterial infections associated with body piercing, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and streptococcal species are the most common involved pathogens [6]. We report a case of endocarditis by *S. aureus*, with severe systemic complications including meningitis, in a young female patient without cardiac abnormalities, rarely occurred even after the removal of a nape piercing.

■ CASE PRESENTATION

A 21 year-old Caucasian female patient with no medical pre-existing conditions was urgently re-

ferred to an Infectious Diseases hospital in Rome, because of high fever (39.5°C) three days earlier, arthromyalgia, confusion, headache, visual impairment and dysarthria. The patient appeared agitated, confused, aggressive and aphasic, and was admitted with the suspect of a meningo-encephalitis. On physical examination, the sensorium was slowed down, *rigor nuchalis* was present and the Brudzinski sign was positive.

The anamnesis, collected with the help of parents, evidenced that the patient got a nape piercing one year before. It caused recurrent local infections, treated with local antiseptics. Therefore, the piercing was removed two months before hospital admission. Nevertheless, another episode of local infection, associated with a small fluctuating swelling under the skin, occurred few days before the onset of symptoms. No personal or family history of cardiac abnormalities was reported.

On admission, a small scab at the piercing site was visible, physical examination revealed tachycardia 140 beats per minute, tachypnea, blood pressure 90/40 mmHg, body temperature 40°C. Oxygen saturation was equal to 99%, and blood tests showed a white cell count of 8400 cells/ μ L (95.8% neutrophils and 2.4% lymphocytes), normocytic anemia (Hb: 11.8 g/dl), thrombocytopenia (PLT: 62000/ μ L), total bilirubin of 2.3 mg/dl with direct bilirubin of 2.2 mg/dl, serum glucose and creatinine levels of 117 mg/dl and 1.37 mg/dl respectively, elevated aminotransferases (AST normal values \times 1.8 and ALT normal values \times 3.4), increased INR (1.75), hypoalbuminemia (2.9 g/dl) and a marked increase in CRP (29 mg/dl). HBV, HCV and HIV

Corresponding author

Raffaella Pisapia

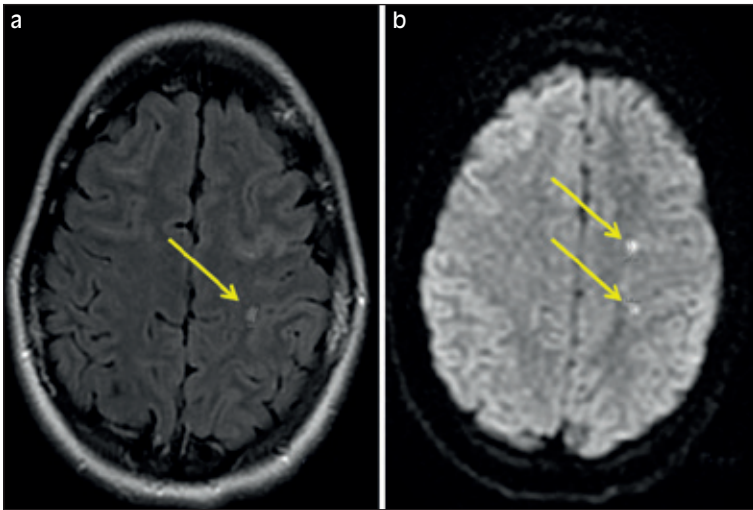
E-mail: raffaella.pisapia@inmi.it

serological markers were negative. A brain computed tomography (CT) without contrast and a chest X-ray were both unremarkable. Cerebrospinal fluid analysis showed a glucose value of 52 mg/dL, proteins 140 mg/dL and a cell count of 130/mm³ with a prevalence of granulocytes.

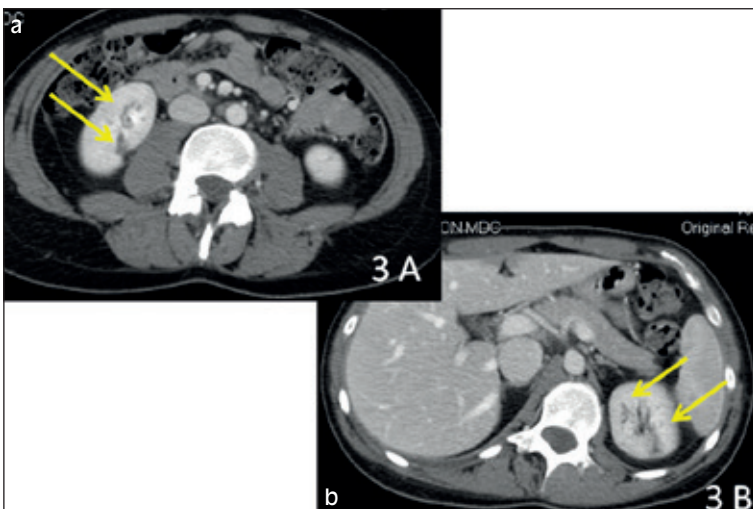
During hospitalization, the patient developed cutaneous embolic lesions (Janeway lesions and petechiae in the lower limbs, and splinter haemorrhages in the fingernails) (Figures 1A-1B) and periungueal Osler nodules. The brain magnetic resonance imaging (MRI) with contrast showed



Figures 1 - A, B - Petechiae in the lower limbs and splinter haemorrhages in the fingernails.



Figures 2 - A, B - Emboli within the cerebellum bilaterally and within the left semioval center.



Figures 3 - A, B - Emboli in the renal cortex bilaterally.

the presence of emboli within the cerebellum bilaterally and within the left semioval center, with meningeal enhancement (Figures 2A-2B). Thoracic and abdominal CT scan revealed the presence of bilateral pleural effusion and emboli in the renal cortex bilaterally (Figures 3A-3B). Retinal haemorrhages and Roth spots were evidenced at the *fundus oculi* examination and at the retinal fluorescein angiography. Both blood and cerebrospinal fluid cultures were positive for methicillin-sensitive *S. aureus*.

Both transthoracic and transesophageal echocardiograms performed 10 and 22 days after admission were negative for vegetations. The diagnosis of endocarditis was made on the basis of modified Duke criteria: 1 major criteria (blood culture for typical microorganism) and 3 minor criteria (fever, vascular and immunological phenomena) were present [7].

The patient was successfully treated with i.v. oxacillin 2g 6 times/day for 6 weeks, plus gentamicin 80 mg 3 times/day for 5 days, with no adverse events. She was discharged after 40 days in good clinical conditions. One month after discharge, retinal lesions disappeared, and both brain MRI and renal ultrasound were normal.

■ DISCUSSION

Recently, the so-called “body art” has become a socio-cultural phenomenon among young people in industrialized countries. Infective complications after these practices are reported, and range from local infections to life-threatening systemic infections [1-4].

Some cases of infective endocarditis (IE) as a complication of tattooing and body piercing have been reported among adolescents and young adults, with and without congenital heart disease. A review describes 22 cases of IE: 21 were associated with piercing (seven at the tongue, six at the ear lobes, five at the navel, and one each at lip, nose and nipple); one was reported in a heavily tattooed person. Nine among these cases (41%) occurred in individuals with underlying heart diseases and/or congenital abnormalities, and one patient died [1].

Among infective complications, IE and brain abscesses are mainly associated with piercing of the head (*i.e.*, nose, eyebrow, ear, mouth and tongue),

and *S. aureus*, *Staphylococcus epidermidis*, *Neisseria* or *Haemophilus* species are generally involved [1,8]. To our knowledge, this is the first case of IE following a nape piercing.

Several factors may contribute to the development of an IE after body piercing: the piercing site represents a portal for infections, with consequent transient bacteraemia, both during jewellery pulling, and until the tract is closed [9, 10]. Therefore, conscientious aftercare by the customer is crucial to avoid infections [11].

In our case, nape piercing was complicated by recurrent local infections treated with local disinfectants only. The piercing was removed but an episode of local inflammation occurred about seven days before the hospital admission. This highlights that severe infections may occur after piercing removal, also.

The wisdom of antibiotic prophylaxis before body piercing has been a matter of debate and guidelines provide conflicting suggestions. According to the American Heart Association guidelines for prevention of IE, antibiotic prophylaxis is considered reasonable for skin procedures (including body piercing) only in patients with the highest risk of an adverse outcome from IE [12]. Conversely, guidelines from the British Association of Dermatologists and the British Society for Dermatological Surgery state that antibiotic prophylaxis is not required for routine dermatological procedures even in the presence of a pre-existing heart abnormalities [13].

In conclusion, actually many individuals are unaware of complications related to body piercing, and do not seek medical care promptly. Therefore, there is an urgent need to disseminate adequate and timely information on the risks associated with body piercing, given the increasing numbers of people undergoing to body piercing and tattooing.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

COMPETING INTERESTS

The authors declare that they have no competing interests.

Authors' contributions

AM clinically managed the case and contribute to the writing of the paper; RP collected data about patient history, and was a major contributor in writing the manuscript; AA, CT, AR, LV contributed to the clinical management of the patient and to the writing of the paper; GDO took final clinical decision about patient and contributed to the writing of the paper. All authors read and approved the final manuscript.

Acknowledgements

Not any

Source of funding

This work was supported by the Ministero della Salute, Italia-Ricerca Corrente, Istituti di Ricovero e Cura a Carattere Scientifico.

Keywords: endocarditis, meningitis, piercing.

SUMMARY

Body piercing is a social phenomenon on the rise especially among young people. This procedure may be complicated by serious bacterial and viral infections. We report a case of *Staphylococcus aureus* infective endocarditis and meningitis arising from the site of a nape piercing, after its removal. A 21 year-old Italian female was admitted to hospital with neurological impairment and sepsis. A diagnosis of endocarditis associated with meningitis by *S. aureus*, complicated by septic emboli in the brain, retina, skin and kidney,

was formulated on the basis of modified Duke's criteria. The likely port-of-entry was the site of a nape piercing, removed two months before. In view of the widespread practice of body piercing, provision of correct and timely information concerning the associated serious risks is now imperative. Such information should emphasise the option for antibiotic prophylaxis, and the importance of careful local hygiene, even after piercing removal.

RIASSUNTO

Il body piercing è un fenomeno sociale in aumento soprattutto tra i giovani.

Questa procedura può essere complicata da gravi infezioni batteriche e virali. Riportiamo un caso di una infezione da *Staphylococcus aureus* risultante in una endocardite infettiva ed una meningite, derivanti dal sito di un piercing nucale, dopo la sua rimozione.

Una ragazza italiana di 21 anni, senza patologie intercorrenti, viene ricoverata con sintomi neurologici e settici. Una diagnosi di endocardite, con associata meningite, da *S. au-*

reus, complicate da embolia settica nell'encefalo, retina, cute e reni, è stata formulata sulla base dei criteri di Duke modificati. Il probabile sito di ingresso è stato il sito di un piercing nucale, rimosso 2 mesi prima.

In considerazione della grande diffusione della pratica del piercing, la diffusione di informazioni corrette e tempestive sui rischi gravi associati è molto importante. Queste informazioni dovrebbero includere la possibilità di praticare una profilassi antibiotica, e sottolineare l'importanza di un'attenta igiene locale, anche dopo la rimozione del piercing.

REFERENCES

- [1] Armstrong M.L., DeBoer S., Cetta F. Infective endocarditis after body art: a review of the literature and concerns. *J. Adolesc. Health* 43, 217-225, 2008.
- [2] Meltzer D.I. Complications of body piercing. *Am. Fam. Physician*. 72(10), 2029-2034, 2005.
- [3] Mariano A., Mele A., Tosti M.E., et al. Role of beauty treatment in the spread of parenterally transmitted hepatitis viruses in Italy. *J. Med. Virol.* 74(2), 216-220, 2004.
- [4] Tweeten S.S., Rickman L.S. Infectious complications of body piercing. *Clin. Infect. Dis.* 26, 735-740, 1998.
- [5] Kennedy B.S., Bedard B., Younge M., et al. Outbreak of *Mycobacterium chelonae* infection associated with tattoo ink. *N. Engl. J. Med.* 367(11), 1020-1024, 2012.
- [6] Khanna R., Kumar S.S. Pathogens causing infections related to body piercing should be determined. *Br. Med. J.* 320, 1211, 2012.
- [7] Li J.S., Sexton D.J., Mick N., et al. Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. *Clin. Infect. Dis.* 30(4), 633-638, 2000.

- [8] Herskovitz M.Y., Goldsher D., Finkelstein R., et al. Multiple brain abscesses associated with tongue piercing. *Arch. Neurol.* 66(10), 1292, 2009.
- [9] Armstrong M.L., Koch J.R., Saunders J.C., et al. The hole picture: risks, decision making, purpose, regulations, and the future of body piercing. *Clin. Derm.* 25, 398-406, 2007.
- [10] Millar B., Moore J. Antibiotic prophylaxis, body piercing & infective endocarditis. *J. Antimicrob. Chemother.* 53, 123-126, 2004.
- [11] Kluger N. Bacterial endocarditis and body art: suggestions for an active prevention. *Int. J. Cardiol.* 136(1), 112-113, 2009.
- [12] Wilson W., Taubert K.A., Gewitz M., et al. Prevention of infective endocarditis: guidelines from the American Heart Association: a guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anaesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *Circulation* 116(15), 1736-1754, 2007.
- [13] Therapy Guidelines and Audit Sub-Committee (TGASC) of the British Association of Dermatologists and the British Society for Dermatological Surgery (BSDS). Antibiotic Prophylaxis for Endocarditis in Dermatological Surgery. Retrieved from: <http://www.bad.org.uk/healthcare/guidelines/surgery.asp> Last accessed November 15, 2014.