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 septicemia. 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 referred 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 meningoencephalitis. On physical examination, the sensorium was slowed down, rigor nucalis 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/µL (95.8% neutrophils and 2.4% lymphocytes), normocytic anemia (Hb: 11.8 g/dl), thrombocytopenia (PLT: 62000/µL), 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 x1.8 and ALT normal values x3.4), increased INR (1.75), hypoalbuminemia (2.9 g/dl) and a marked increase in CRP (29 mg/dl). HBV, HCV and HIV
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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/mmc 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 periungual 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 semi-oval 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-sensible 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.

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**REFERENCES**


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