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Case report

Severe hepatic abscess: Conservative treatment of multi-organ infection by Stenotrophomonas maltophilia. A case report

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ABSTRACT

Introduction: Stenotrophomonas Malthophilia (SM) is generally considered a nosocomial pathogen but it has also been reported as a cause of community-acquired systemic infection. We reported a rare case of SM multi-organ infection involving the liver and the left ocular region.

Presentation of the case: A 64 years old man presented with fever for 4 days and acute blindness of the left eye. We performed an abdomen and head CT scan that identified respectively a liver lesion in central region, likely a hepatic abscess, and inflammation process involving the left eye. After 5 days of antibiotic therapy, no improvement of the clinical condition was noted. A CT guided drainage of the hepatic abscess was performed. SM was identified in the content of the drain and selected antibiotic therapy with combination of tygecycline and TMP-SMX was immediately initiated.

After 15 days of the selected therapy, the hepatic abscess and the left eye infection were completely resolved but unfortunately the patient reported permanent blindness.

Discussion: Several studies identified most of the SM infections as nosocomial, however that can be excluded in this case because the patient presented signs of severe systemic infection 72 h before the hospitalization. The conservative treatment, with a combination of CT guided drainage and selected antibiotic therapy, gave good results.

Conclusion: Although SM is thought to be a nosocomial pathogen, it can be involved in severe systemic sepsis affecting different organs outside the hospital setting. Fortunately, the combination of tigecycline with TMP-SMX seems to be the best therapeutic option.

1. Introduction

S. maltophilia is a Gram-negative obligate aerobe bacillus and an environmental multiple-drug-resistant organisms (MDRO).

A significant feature of SM is its ability to adhere to plastics and form bacterial films; in fact, it has been identified on the surfaces of materials used in intravenous (i.v.), such as cannulae, prosthetic devices, dental unit waterlines and nebulizers.

It is not considered a highly virulent pathogen, but it has emerged as an important nosocomial pathogen associated with crude mortality rates ranging from 14 to 69% in patients with bacteremia.

Several infections are associated with SM, including respiratory tract infections, bacteremia, biliary sepsis, soft tissues, endophthalmitis, eye infections, endocarditis and meningitis [1–3].

Risk factors for SM infection include underlying malignancy (particularly those with obstructive lung cancer), the presence of indwelling devices (e.g., catheters), chronic respiratory disease, immunocompromised host, prior use of antibiotics and long-term hospitalization or ICU stay [4–7].

The incidence of S. Maltophilia hospital-acquired infections is increasing, particularly in the immunocompromised patient population but it is not solely a nosocomial pathogen.

It has also been reported as a pathogen associated with community acquired infections [1,8].

This case report has been accounted for in line with the SCARE criteria [9].

1.1. Case presentation

A 64 years old man presented in Accident and Emergency (AE) complaining fever for 4 days (TC 38 °C) on antibiotic therapy with penicillin, sore throat and acute blindness of the left eye.

His past medical history included right lung tumor in 2006 treated with surgical resection and chemotherapy.

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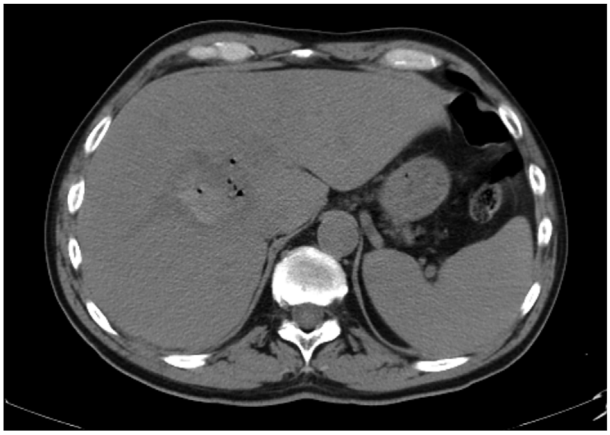

Fig. 1. Liver lesion (about 8–10 cm in size) IV–VIII hepatic segment.

He also reported one accidental episode of injury by a foreign body involving the left eye one week before the AE admission. The patient was riding in the open countryside when he had the accident, describing it as not a severe injury caused by a tiny foreign body. He immediately washed the eye and went home.

On clinical observations assessment, the body temperature was 38,5 °C, blood pressure (BP)100/60 mmHg, heart rate (HR)100 bpm. The clinical examination reported generalized tenderness in abdomen, left eye ptosis, left eyelid oedema. Neurological examination was negative and the ophtalmologist review revealed iridocyclitis with fibrin deposits in the anterior capsule of lens.

The bloods test showed raised value of C-reactive protein (CRP) around 380 mg/L, white blood count (WBC) 6.7 × 10^3 with Neutrophilia (Neut) 86.6%, glutamic-oxaloacetic transaminase (GOT) 239 U/L, glutamic-pyruvic transaminase (GPT) 291 U/L, Fibrinogen 971 mg/dl.

The radiological investigation (CT scan abdomen and head) requested in AE identified respectively an 8 cm liver lesion in central region (IV-VIII segment), likely a hepatic abscess (Fig. 1), and inflammation process in the left orbital region (Fig. 2).

After 12 hours, the patient was referred to our ward (General Surgery Unit) for the management of the case.

Empiric antibiotic therapy was initiated with intravenous infusion of piperacillin + tazobactam 4,5 g three times a day (TDS), Ertapenem 500 mg TDS and 1g of penicillin TDS.

After 5 days of antibiotic therapy, patient underwent an abdomen CT scan that confirmed the presence of the liver lesion, increased in size around 11 × 15 cm, with massive intrabdominal collection and in the next blood test WBC 14 × 10^3 with Neut 86.6% and Total bilirubin 3.87 mg/dl (direct 2.44, indirect 1.43).

After two days, with the patient febrile, we proceeded with CT guided drainage of the hepatic abscess, placing an 8 French drain (350 ml of serous – hematic content) and a sample of drain content was sent for cytology test and culture examination. For that procedure, the patient was transferred to another hospital, where a dedicate team of interventional radiologists performed the drainage. Unfortunately, the time spent to organize the patient's transfer caused a delay in the treatment.

We also requested a MRI head that revealed the presence of ophthalmic nerve lesion.

The day after, the patient was afebrile with inflammatory markers and liver function values reduced (WBC 10.8 × 10^3, Neut 83.2%), GOT 72 U/L, GPT 122 U/L Total bilirubin 1.84 mg/dl (direct 0.88, indirect 0.96).

On the 12th day, we had microbiological culture results that were positive for Stenotrophomonas Maltophilia, sensitive to trimethoprim-sulfamethoxazole and colistin. The cytologist report was negative for neoplastic cells.

For that reason, we immediately changed the previous antibiotic therapy giving a combination of Tigecycline (initial dose of 100 mg followed by 50 mg 2 times a day for 14 days IV) with trimethoprim-sulfamethoxazole (TMP-STX) at dose of 160 mg + 800 mg two times a day orally.

Following five days of the selected antibiotic therapy, we noticed a reduction of the hepatic abscess size around 86 mm in diameter (Fig. 3) associated with an improvement of left eye infection (reduction of the oedema).

On the 15th day of therapy, the hepatic abscess was completely resolved with absence of disease confirmed by following ultrasound scans (USS). The left eye infection was completely healed but unfortunately the patient reported permanent blindness due to the ophthalmic nerve lesion.

All clinical, laboratory and radiological parameters are summarized in Table 1.

The patient was discharged 41 days after the initial admission in our ward with stable clinical conditions. The reason of the delayed discharge was the presence of a small hematoma around the liver due to drain removal that caused reduced values of hemoglobin.

2. Discussion

S. Maltophilia is increasing its pathogen activity worldwide, and it is necessary to monitor its antibiotic resistance, persistence, and spread within the community, including health care settings.

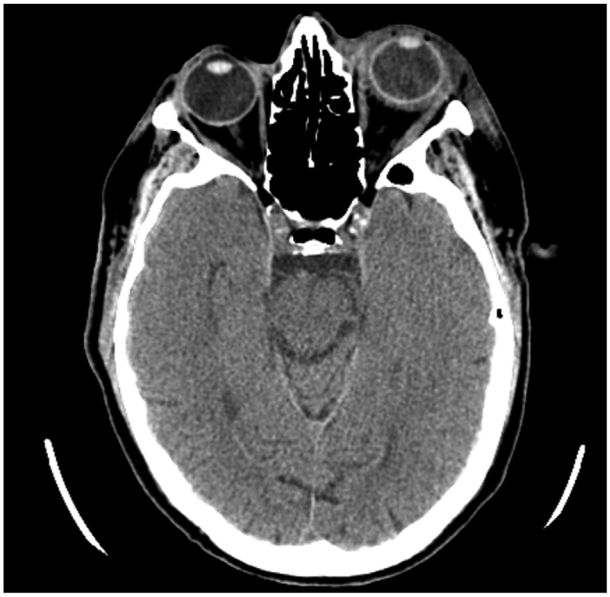

Fig. 2. Inflammation process in the left orbital region.

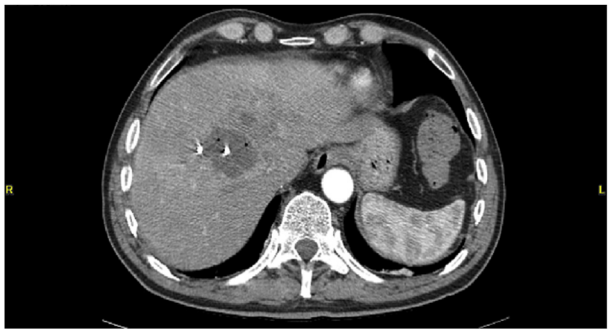

Fig. 3. Hepatic abscess after 5 days of selected antibiotic therapy.

Table 1
All clinical, laboratory and radiological parameters detected.

Hospital stay (days)	Body temperature	WBC	CRP (mg/L)	Amount of drainage (ml)	Antibiotic therapy	Size of liver abscess	Ocular oedema
1°	38.5C	6.7 × 10^3 with Neutrophilia (Neut) 86.6%	380	N/A	piperacillin + tazobactam 4,5 g (TDS), Ertapenem 500 mg TDS and 1g of penicillin TDS.	8 cm	Present
5°	37.5C	WBC 14 × 10^3 with Neut 86.6%	300	N/A	piperacillin + tazobactam 4,5 g (TDS), Ertapenem 500 mg TDS and 1g of penicillin TDS.	11 cm	N/A
7°	38.5C	N/A	N/A	350 ml	piperacillin + tazobactam 4,5 g (TDS), Ertapenem 500 mg TDS and 1g of penicillin TDS.	N/A	N/A
8°	36.5	WBC 10.8 × 10^3, Neut 83.2%	280	200 ml	piperacillin + tazobactam 4,5 g (TDS), Ertapenem 500 mg TDS and 1g of penicillin TDS.	N/A	N/A
12°	36	N/A	N/A	160 ml	Tygecycline (160 mg) + + TMP-STX (800 mg) twice a day	N/A	N/A
17°	37	WBC 9.8 × 10^3, Neut 80.2%	125	120 ml	Tygecycline (160 mg) + TMP-STX (800 mg) twice a day	8.6 cm	reduced
22°	36.5	WBC 9.0 × 10^3, Neut 78%	80	80 ml	Tygecycline (160 mg) + TMP-STX (800 mg) twice a day		N/A
27°	36.2	WBC 9.5 × 10^3, Neut 78%	45	50 ml	Tygecycline (160 mg) + TMP-STX (800 mg) twice a day	0,5 cm	healed

Community-acquired SM (defined as infections that occurred 48 or 72 h prior to hospitalization) has been reported for child and adult patients and includes bacteremia, ocular infections, respiratory tract infections, wound/soft tissue infections, urinary tract infections, conjunctivitis, otitis, and cellulitis [8,10].

In our case, patient presented in the Hospital with high fever on penicillin therapy and acute blindness of the left eye for 4 days. The inflammatory markers were raised and the radiological investigations revealed clearly signs of systemic infection.

In his past medical history, he also reported right lung tumor in 2006 for which he underwent lung resection followed by chemotherapy course. Although he had experienced it several years ago, not mentioning any other comorbidities, it can be considered a risk factor for SM infection [4].

Many studies have suggested that respiratory tract infections by SM are more frequent than intrabdominal infections with a major incidence in immunocompromised hosts [1,10,11].

Liver abscess caused by this pathogen has been reported very rarely by the literature [11,12]. In 2001 Calza L et al. described a case report regarding a 43-year-old homosexual male patient with advanced HIV disease who developed hepatic abscess localized at the sixth segment of the liver, approximately 40 mm in diameter. He was treated with ultrasonography-guided percutaneous drainage and intravenous amoxicillin-clavulanate plus levofloxacin for 14 days, becoming asymptomatic after 7 days with the complete resolution of the liver focal lesion in 6 weeks [13]. We managed our case approximately in a similar way, except for antibiotic therapy that consisted in the combination of tygecycline with TMP-STX with a complete healing of the hepatic abscess in 15 days. Obviously, in our case the patient was immunocompetent and the healing process was shorter than the patient with advanced HIV.

Regarding orbital infection related to SM, Chwiejczak K et al. described a case report of a 53 years old man, who presented with signs of orbital cellulitis on the right side which developed over a few days following an injury. Orbital swab and blood culture identified the presence of SM [14]. The same source of infection is described in medical history of our patient who had a left eye injury by a foreign body one week before the initial admission.

The simultaneous infection of liver and eye by SM is not described in literature yet but we cannot exclude the possibility of correlation in our case. We reckon SM infection started in the eye, spreading via blood to the liver and causing the abscess. Since the involvement of the liver and eye in the infection was present at admission, we don't think it was a nosocomial SM infection caused by initial empiric antibiotic treatment.

Although the use of the bacteriostatic compound TMP-SMX has been the preferred treatment of SM infections, new treatment strategies have been proposed considering the use of selected antibiotics in synergy [15–17].

Some synergism has been observed between tigecycline and TMP-SMX, and between tigecycline and amikacin, against S. maltophilia [18–20]. The pathogen isolated in our sample was susceptible to TMP-SMX and to colistin. However, we decided to associate tygecycline with TMP-SMX because it was one of the selected antibiotic mentioned and easily available in our ward. According to our experience, this combination has given good results producing a complete healing of the liver abscess in 15 days of treatment.

3. Conclusion

S. Maltophilia is usually considered a nosocomial pathogen, able to cause severe systemic infection in immunodeficiency conditions. During our clinical working experience, it is important not to exclude the possibility to deal with complicated SM multi organ infections acquired in community. For that reason, it is necessary to identify the pathogen involved and initiate a selected antibiotic therapy as soon as

possible. We can confirm that the combination of tigecycline with TMP-SMX could be one of the effective therapeutic options for systemic infections by S. Maltophilia.

Ethical approval

Our study was exempt from ethical approval in our institution.

Sources of funding

None.

Author contribution

Angela Inviati: study concept or design, data collection.
Domenico Massimo Pellegrino: review of study.
Domenico Schifano: data collection, writing the paper.

Conflicts of interest

None.

Research registration number

N/A.

Guarantor

Angela Inviati.

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 on request.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.amsu.2018.09.001

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