

Multiple Purulent Arthritis, Epidural Abscess, and Panophthalmitis Induced By *Streptococcus dysgalactiae* subsp. *Equisimilis* infection

Akihiko Kondo MD¹, Kazuhiko Omori MD.PhD², Hiroki Nagasawa MD³, Ikuto Takeuchi MD⁴, Kei Jitsuiki MD⁵,

Hiomichi Ohsaka MD.PhD⁶, Kouhei Ishikawa MD.PhD⁷, Youichi Yanagawa MD.PhD⁸

¹⁻⁸Department of Acute Critical Care Medicine, Juntendo University Shizuoka Hospital, Japan

*Corresponding author

Dr. Youichi Yanagawa

Email: yyanaga@juntendo.ac.jp

Abstract: An 80-year-old female who had had difficulty moving for the previous week was transferred to a local medical facility. After obtaining a diagnosis of multiple organ failure with multiple purulent arthritis and epidural abscess, she was transported to our department. She had a history of diabetes mellitus. She had also been complicated with left panophthalmitis. She developed complications with thrombocytopenia and died of alveolar hemorrhaging. This is the first case of multiple purulent arthritis, epidural abscess, and panophthalmitis induced by SDSE infection. Physicians should consider invasive SDSE infections when treating elderly patients with underlying comorbidities, such as diabetes mellitus.

Keywords: *Streptococcus dysgalactiae* subsp. *Equisimilis*; diabetes mellitus; epidural abscess; warfarin

INTRODUCTION

Among clinically isolated β -hemolytic streptococci, *Streptococcus pyogenes* and *S. agalactiae* were considered the main pathogens in humans until recently [1]. In 1996, *S. dysgalactiae* subsp. *equisimilis* (SDSE) was proposed as a novel taxon among human-derived streptococcal isolates [1]. SDSE has Lancefield group C or G antigens, exhibits strong β -hemolysis, and exerts streptokinase activity upon human plasminogen and proteolytic activity upon human fibrin [1]. SDSE may exist among the normal flora of the skin, oropharynx, and gastrointestinal and genitourinary tracts [1]. In the 21st century, invasive SDSE infection (i.e. cellulitis, urosepsis, and pneumonia) leading to various disseminated diseases is being diagnosed increasingly in Japan and elsewhere in Asia, Europe, and America [1].

We herein report a case of multiple purulent arthritis, epidural abscess and panophthalmitis induced by SDSE.

CASE REPORT

An 80-year-old female who had had difficulty moving for the previous week was transferred to a local medical facility. After obtaining a diagnosis of multiple organ failure with multiple purulent arthritis and epidural abscess (Figure 1), she was transported to our department for intensive care the same day as she was transferred. She had a history of diabetes mellitus. At arrival, her vital signs were as follows: Glasgow Coma Scale, E3V4M6; blood pressure, 88/56 mmHg; pulse rate, 88 beats per minute; respiratory rate, 24 breaths per minutes; and body temperature, 36.6 °C. She had

back pain and painful bilateral knee swellings. Chest roentgen and electrocardiogram findings were negative. Her arterial gas (under 3 L/minO₂) revealed a pH of 7.42, PCO₂ of 24 mmHg, PO₂ of 107 mmHg, HCO₃⁻ of 16.2 mmol/L, and base excess of -6 mmol/L. The results of the biochemical analyses of the blood on arrival were as follows: white blood cells, 22,000/ μ l; hemoglobin, 11.0 g/dl; platelets, 20.1 \times 10⁴/ μ l; aspartate aminotransferase, 258 IU/L; alanine aminotransferase, 132 IU/L; glucose, 180 mg/dl; blood urea nitrogen, 134.1 mg/dl; creatinine, 5.3 mg/dl; sodium, 140 mEq/L; potassium, 4.8 mEq/L; chloride, 93 mEq/L; creatine phosphokinase, 4389 IU/L; prothrombin time 14.4 (12.2) sec; activated partial thromboplastin time, 25.3 (28.0) sec; 33.1 μ g/ml.

The patient underwent tracheal intubation. As she had multiple organ failure due to septic shock, he received tracheal intubation with mechanical ventilation, continuous infusion of vasopressor, continuous hemodiafiltration, and antibiotics (meropenem and vancomycin) after drainage of the bilateral knee abscesses. Surgical drainage for the epidural abscess was not performed, at the behest of the orthopedician, due to the patient's severe medical condition.

On the third hospital day, SDSE infection was confirmed based on the results of culture from the knee. Antibiotics were switched to ampicillin based on the sensitivity of the culture, and continuous hemodiafiltration was ceased after obtaining urinary flow. Her circulation and respiration improved, and extubation was performed on the seventh day. After

extubation, she complained of left eye and shoulder pain. She had also been complicated with left purulent arthritis at the shoulder and left panophthalmitis. She could not move, so she underwent continuous infusion of heparin on the eighth hospital day. The left eyeball was removed on the 14th hospital day. She was able to feed herself but still could not walk because of pain in the bilateral knees. After being prescribed warfarin to prevent deep vein thrombosis instead of the infusion of heparin on the 27th day, she developed complications

with thrombocytopenia 2 days later. Her platelet level suddenly decreased to 1,100 from $20.6 \times 10^4 \mu\text{l}$ without any signs of an exacerbation of infection or thrombosis. Transfusion and the infusion of steroids as well as ceasing warfarin failed to increase the platelet count, and she eventually died of alveolar hemorrhaging on the 32nd day. Antibodies for both heparin-induced thrombocytopenia and idiopathic thrombocytopenia were negative.

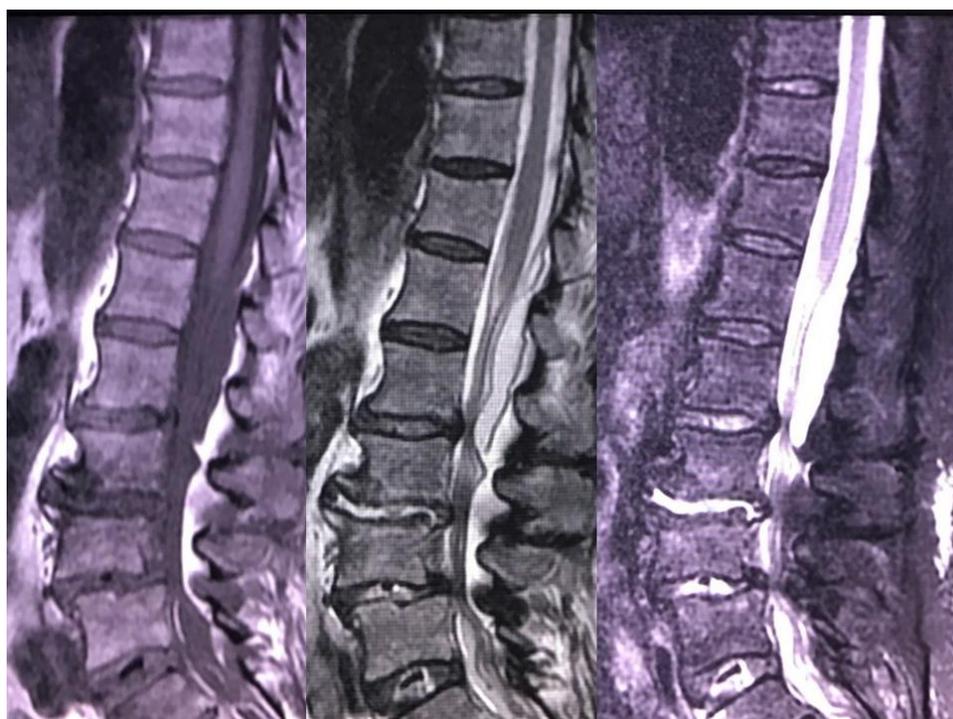


Fig-1: Lumbar magnetic resonance image (MRI) obtained at a local medical facility showing the epidural abscess (Left: T1, Middle T2, Right: STIR image).

DISCUSSION

This is the first case of multiple purulent arthritis, epidural abscess, and panophthalmitis induced by SDSE infection. SDSE infection can range in severity from relatively mild skin and soft tissue conditions, such as wound infection, erysipelas, and cellulitis, to life-threatening necrotizing fasciitis and streptococcal toxic shock syndrome, thus sharing a clinical picture with *S. pyogenes* [2-4]. The most common clinical manifestation of bacteremia is cellulitis [3]. Arthritis and ophthalmitis induced by SDSE have been reported; however, epidural abscess or the combination of arthritis and ophthalmitis induced by SDSE has not been reported [5,6]. Invasive forms of this infection are most commonly found in elderly patients with underlying comorbidities, such as diabetes mellitus, similar to the present case [1-4]. The fatality rate for bacteremia has been reported to be 15%-18% [1]. We performed drainage of the bilateral knee abscesses and removed the infected eyeball in addition to infusing appropriate anti biotics. The present case showed temporary relief of the patient's severe medical conditions, but she unfortunately died due to drug side

effects. Radical treatment including bilateral amputation of the knees and surgical drainage of the epidural abscess might have allowed the patient to achieve a survival outcome [7,8]. However, she was elderly and would have become totally dependent on others in her daily life after such radical procedures.

Warfarin-induced thrombocytopenia has not been reported in the English literature. This case might be HIT please spell out all abbreviations at first mention because the patient met three of the four Ts [9,10]. However, one case report concerning thrombocytopenia induced by warfarin has been published in Japan [11]. This case was confirmed as being due to an unintentional challenge test of warfarin. As such, the thrombocytopenia observed in the present case might have been induced by warfarin.

REFERENCES

1. Takahashi T, Ubukata K, Watanabe H. Invasive infection caused by *Streptococcus dysgalactiae* subsp. *equisimilis*: characteristics of strains and

- clinical features. *Journal of Infection and Chemotherapy*. 2011 Jan 1; 17(1):1-0.
2. Leitner E, Zollner-Schwetz I, Zarfel G, Masoud-Landgraf L, Gehrler M, Wagner-Eibel U, Grisold AJ, Feierl G. Prevalence of emm types and antimicrobial susceptibility of *Streptococcus dysgalactiae* subsp. *equisimilis* in Austria. *International Journal of Medical Microbiology*. 2015 Dec 31; 305(8):918-24.
 3. Rantala S. *Streptococcus dysgalactiae* subsp. *equisimilis* bacteremia: an emerging infection. *European journal of clinical microbiology & infectious diseases*. 2014 Aug 1;33(8):1303-10.
 4. Takahashi T, Sunaoshi K, Sunakawa K, Fujishima S, Watanabe H, Ubukata K. Clinical aspects of invasive infections with *Streptococcus dysgalactiae* ssp. *equisimilis* in Japan: differences with respect to *Streptococcus pyogenes* and *Streptococcus agalactiae* infections. *Clinical Microbiology and Infection*. 2010 Aug 1;16(8):1097-103.
 5. Astete CA, Gómez NS, Alarcón ML. Septic Arthritis by *Streptococcus equi*. *Reumatología Clínica (English Edition)*. 2016;4(12):237-8.
 6. Yong AS, Lau SY, Woo TH, Li JY, Yong TY. *Streptococcus dysgalactiae* endocarditis presenting as acute endophthalmitis. *Infectious disease reports*. 2012 Jan 2; 4(1).
 7. Horowitz DL, Katzap E, Horowitz S, Barilla-LaBarca ML. Approach to septic arthritis. *American family physician*. 2011 Sep 15; 84(6).
 8. Pourtaheri S, Issa K, Stewart T, Patel Y, Sinha K, Hwang K, Emami A. When Do You Drain Epidural Abscesses of the Spine?. *Surgical technology international*. 2016 Oct; 29:374-8.
 9. Ahmed I, Majeed A, Powell R. Heparin induced thrombocytopenia: diagnosis and management update. *Postgraduate medical journal*. 2007 Sep 1;83(983):575-82.
 10. Favalaro EJ, McCaughan G, Pasalic L. Clinical and laboratory diagnosis of heparin induced thrombocytopenia: an update. *Pathology*. 2017 Apr 23.
 11. Nito U, Hahara T. A case of thrombocytopenia induced by war farin. *Kotui Igaku* 62:22, 2008. In Japanese