# Case Report

# Typhoid Spondylodiscitis: the First Reported Case in Southeast Asia and Review of the Literature

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*We describe the first case of typhoid spondylodiscitis in Southeast Asia, and the literature were also reviewed. A 57-year-old diabetic Thai man who presented with a one-month course of progressive low back pain associated with paraparesis and bowel-bladder dysfunction. Examination revealed local tenderness over T12 area, spastic paraparesis, impaired pinprick sensation up to T12 level, and loose anal sphincter tone. Magnetic resonance imaging showed spondylodiscitis of T11 and T12 and epidural abscess causing spinal cord compression. T11 and T12 laminectomy, T11/12 discectomy, and debridement of epidural abscess were performed, and the cultures of the pus grew* Salmonella *Typhi. He was treated with intravenous ciprofloxacin for three weeks and was discharged from the hospital with oral ciprofloxacin and trimethoprim-sulfamethoxazole for another five months of treatment. The patient was doing well when last seen two months after discontinuation of antimicrobial treatment. In addition, a total of ten cases of typhoid spondylitis/ spondylodiscitis were reviewed.*

***Keywords:*** *Salmonella, Salmonella Typhi, Typhoid, Spondylodiscitis, Spondylitis, Epidural abscess*

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## Background

*Salmonella* Typhi is a motile Gram-negative bacillus that always infects or colonizes human. Typhoid fever is a systemic infectious disease caused by the dissemination of this organism arising from the gastrointestinal tract, and is commonly characterized by fever and abdominal pain. It was commonly reported in South and Southeast Asia where the sanitation are very poor[1]. However, typhoid spondylodiscitis is extremely rare; only a handful cases have been reported in the literature[2,3]. This is the first reported case of typhoid spondylodiscitis in Southeast Asia. In addition, a total of ten cases of typhoid spondylitis/ spondylodiscitis were reviewed.

## Case Report

A 57-year-old diabetic Thai man was admitted to King Chulalongkorn Memorial Hospital, Bangkok, Thailand, because of a one-month course of progressive low back pain associated with subsequent development of paraparesis and bowel-bladder dysfunction. He had received multiple courses of non-steroidal anti-inflammatory drugs without improvement. Physical examination revealed severe local tenderness over the T12 area, mild spastic paraparesis, impaired pinprick sensation up to the T12 level, and loose anal sphincter tone. A complete blood count revealed a hemoglobin of 11.6 g/dL, a white blood cell count of 12,000 cells/$mm^3$ (80% neutrophils and 20% lymphocytes), and a platelet count of 459,000 cells/$mm^3$. Blood sugar was 160 mg/dL, and other blood chemistry tests were normal. Blood cultures were negative for bacteria. Anti-HIV was negative. Chest radiography was normal, but radiography of the thoracolumbar spine showed kyphosis of the thoracolumbar spine, narrowing of T11/12 disc space, but with no evidence of vertebral endplate erosions. Magnetic resonance imaging (MRI) revealed spondylitis of T11 and T12, discitis of T11/12 disc, and erosions of adjacent vertebral endplates of T11 and T12; the infection extended to anterior epidural space causing spinal cord compression (Fig. 1). Three days after hospitalization, T11 and T12 laminectomy, T11/12 discectomy, and debridement of epidural abscess were performed, and Gram stain of the pus showed numerous Gram-negative bacilli. The cultures of the pus finally grew *Salmonella* Typhi susceptible to all antimicrobials tested by the disc diffusion method. The minimal inhibitory concentration for ciprofloxacin and trimethoprim-sulfamethoxazole was also determined and equaled to 0.032 μg/mL. A careful history taking revealed that he remembered recently having consumed uncooked vegetables. The patient gradually improved after three weeks of intravenous ciprofloxacin (400 mg every 8 hours) treatment, when the antimicrobial was changed to oral ciprofloxacin and trimethoprim-sulfamethoxazole for another five months of treatment. MRI showed improvement of spondylodiscitis and disappearance of epidural abscess. The patient was doing well when last seen two months after discontinuation of anti-microbial treatment.

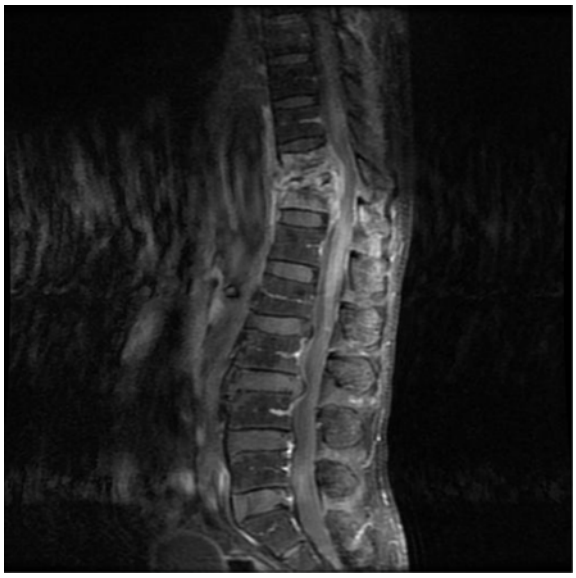

**Fig. 1** Magnetic resonance imaging (T2-weighted post-gadolinium injection) of the thoracolumbar spine before treatment showed spondylitis of T11 and T12, discitis of T11/12, and epidural abscess

## Discussion

Extraintestinal infections are the rare complications of *Salmonella* bacteremia, accounting for 5-10% of all patients[4,5]. Moreover, the occurrence of vertebral osteomyelitis with or without epidural abscess caused by *Salmonella* Typhi is extremely rare, and it mainly occurs in an individual with poor sanitary hygiene who lives in the endemic area. A previous meta-analysis of 915 patients with vertebral epidural abscess showed that *Staphylococcus aureus* was the most common etiologic agent, but there was no *Salmonella* Typhi isolated[6]. In our institute, a retrospective study between 2002 and 2007 revealed the most common pathogen causing epidural abscess was *S. aureus* (42.9% of patients), followed by group B *Streptococcus* (21.4%) and Enterobacteriacae (15%), but there were no *Salmonella* epidural abscess (unpublished data). A recent retrospective review revealed that *Salmonella* Typhi was the causative pathogen in only 13% (6 of 46 patients) of patients with *Salmonella* vertebral osteomyelitis[4]. To date, to the best of our knowledge, there have been 10 cases (including our patient) of typhoid spondylitis/spondylodiscitis in the literature (Table 1)[2,3,7-12]. There were five male and five female patients, with the age ranged from 12 to 57 years. Our patient was the oldest (57 years old). This observation is in contrast with the male preponderance in spondylitis/spondylodiscitis caused by other *Salmonella* spp. and pyogenic bacteria. Of the 10 patients with typhoid spondylitis/spondylodiscitis, only three were compromised

**Table 1.** Summary of ten patients with Typhoid spondylitis/spondylodiscitis with or without epidural abscess from the English literature

| Year, country | Sex, age (years) | Underlying disease/ predisposing condition | Duration of illness | Infection site | Treatment | | Outcome |
|---|---|---|---|---|---|---|---|
| | | | | | Medication | Surgery | |
| 1962, Nigeria[7] | M, 16 | Sickle cell anemia | 3 weeks | L4-5 | Penicillin and streptomycin for 6 weeks | No | Survived without neurological sequelae |
| 1963, England[8] | F, 45 | No, consumption of raw oysters | 2 months | L1-2 | Chloramphenicol for 2 months | Laminectomy | Survived without neurological sequelae |
| 1981, England[9] | F, 12 | No | 3 months | T11-12 | Chloramphenicol and amoxicillin for 2 months | No | Survived without neurological sequelae |
| 1999, South Africa[10] | F, 12 | No | 2 days | L5-S1 | Ampicillin for 6 months | No | Survived without neurological sequelae |
| 1999, South Africa[10] | M, 13 | No | 4 weeks | L4-5 | Ampicillin for 4 weeks | No | Survived without neurological sequelae |
| 2004, Mali[11] | M, 50 | No | 2 weeks | L2-3, psoas abscess | Ceftriaxone and ciprofloxacin for 16 weeks | No | Survived without neurological sequelae |
| 2004, India[12] | F, 38 | No | 3 months | L4-5 | Ceftriaxone for 4 weeks | Laminectomy | Survived without neurological sequelae |
| 2006, Hong Kong[2] | F, 25 | No | 3 weeks | L4-5 | Ampicillin for 6 weeks | No | Survived without neurological sequelae |
| 2008, Jordan[3] | M, 56 | Diabetes | 3 months | T3-4, epidural abscess | Ceftriaxone for 6 weeks | Laminectomy and debridement | Survived with mild neurological sequelae |
| 2008, Thailand* | M, 57 | Diabetes, consumption of raw vegetables | 1 month | T11-12, epidural abscess | Ciprofloxacin for 3 weeks, ciprofloxacin and cotrimoxazole for 6 months | Laminectomy, discectomy and debridement | Survived with mild neurological sequelae |

patients including two diabetic and one sickle cell anemia patients. Our patient had poorly controlled diabetes. Interestingly, no patients in the literature can recognize a history of diarrhea prior to their present illness, probably due to a long incubation period of the disease and the ability of *Salmonella* Typhi to penetrate the intestinal wall without causing the diarrheal symptoms[4,5]. In addition, only three patients had a history of consumption of raw oysters and vegetables (our patient), respectively.

Most patients in the literature had a duration of illness of less than 3 months, with the range from two days to three months. Our patient presented with progressive low back pain and paraparesis without fever. The absence of fever may be due to the effect of non-steroidal anti-inflammatory drugs or the chronicity of the infectious process in a poorly controlled diabetic patient. In addition, fever at the time of presentation was noted in 87% of the patients in the previous study of *Salmonella* vertebral osteomyelitis[4]. In the literature, the most common infection sites of typhoid spondylitis were the lumbar and lower thoracic spines; only one patient with diabetes had spondylitis involving T3 and T4 spines. This feature is in consistent with that caused by other *Salmonella* spp. and pyogenic bacteria.

Our patient was treated with a combination of ciprofloxacin and trimethoprim-sulfamethoxazole. The efficacy of ciprofloxacin for the treatment of osteomyelitis has been documented both in animal and clinical studies[13-15]. Of the 10 patients with typhoid spondylitis/spondylodiscitis in the literature, the choice of antimicrobial therapy was based on the susceptibility results. Ampicillin, penicillin, ceftriaxone, chloramphenicol, and ciprofloxacin have been used successfully. This is in consistent with the previous study that showed various combinations of anti-microbials used in the treatment of *Salmonella* vertebral osteomyelitis[4].

In the litrature, only four patients underwent spinal laminectomy with and without surgical debridement. However, all patients survived with complete or nearly complete neurological recovery. In contrast, the mortality of spondylitis caused by *Salmonella* spp. or pyogenic bacteria in other studies varied between 5% and 40%[4,6]. The difference may be due to younger age group of less than 60 years, immunocompetent condition in most patients, relatively shorter duration of illness, no complicated epidural abscess, and no associated infected aortitis in typhoid spondylitis/spondylodiscitis.

In conclusion, we describe the first case of typhoid spondylodiscitis in Southeast Asia. In addition, a total of 10 cases of typhoid spondylitis/ spondylodiscitis in the literature were also reviewed in this report.

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## *กระดูกสันหลังและหมอนรองกระดูกอักเสบจากเชื้อไทฟอยด์: ผู้ป่วยรายแรกของเอเชียอาฆเนย์ และการทบทวนรายงานผู้ป่วยทั้งหมด*

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*ผู้ศึกษารายงานผู้ป่วยรายแรกที่เป็น spondylodiscitis จากเชื้อทัยฟอยด์ในเอเชียตะวันออกเฉียงใต้ และยังมีการทบทวนวรรณกรรมร่วมด้วย ผู้ป่วยชายไทยเบาหวาน อายุ 57 ปี มาพบแพทย์ด้วยเรื่องปวดหลังส่วนล่างเพิ่มขึ้นนาน 1 เดือน ร่วมกับขา 2 ข้างอ่อนแรงและการสูญเสียหน้าที่ของกระเพาะปัสสาวะและลำไส้ ตรวจร่างกายมีการกดเจ็บบริเวณตำแหน่งกระดูกสันหลังระดับ T12 ขา 2 ข้างอ่อนแรงประเภท spastic ชาเป็นระดับจากเท้าจนถึง T12 และกล้ามเนื้อหูรูดของทวารหนักขมิบไม่ได้ การตรวจคลื่นแม่เหล็กไฟฟ้าพบ spondylodiscitis ของ T11 และ T12 ร่วมกับฝีที่ epidural space กดไขสันหลัง จึงทำผ่าตัด laminectomy และ discectomy ของ T11 และ T12 ร่วมกับนำเอาฝีที่ epidural space ออกผลการเพาะเชื้อจากฝีขึ้นเป็น Salmonella Typhi ผู้ป่วยได้รับ ciprofloxacin ทางหลอดเลือดดำนาน 3 สัปดาห์ และจำหน่ายกลับบ้านด้วย ciprofloxacin และ trimethoprim-sulfamethoxazole รับประทานต่ออีกนาน 5 เดือน ผู้ป่วยแข็งแรงดี ไม่พบมีปัญหาของระบบประสาทหลังหยุดยาปฏิชีวนะ 2 เดือน นอกจากนั้นยังทบทวนวรรณกรรมในผู้ป่วย 10 ราย ที่เป็น spondylitis หรือ spondylodiscitis ของเชื้อทัยฟอยด์*