# *Streptococcus suis* Peritonitis: Case Report

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**Abstract**

A 45-year-old Thai man who presented with peritonitis was seen in a tertiary care centre in Thailand. An exploratory laparotomy was done because of peritonitis from abdominal trauma. Postoperatively the patient received intravenous ceftriaxone and metronidazole, but he developed rhabdomyolysis and acute renal failure. Hemodialysis was performed. After 8 days, the peritonitis had relapsed with hypotension. The patient was given vasopressives but clinicaly deteriorated and expired on day 11. The peritoniteal fluid culture grew *Streptococcus suis* serotype 2 and the organism was resistant to multiple antimicrobial agents including penicillin (MIC > 32 mcg/ml) but was susceptible to vancomycin.

**Key word :** Peritonitis, *S. suis*, Case Report

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*Streptococcus suis (S. suis)* was first described as an important microorganism in pigs and humans in the 1960's in Scandinavia[1] and the infection has been associated with contact with pigs or meat products[2-9]. The infection in humans is usually caused by *S. suis* serotype 2 and presents as septicemia[5,6,8], meningitis[2,4-6,8-10], arthritis [4,8,11], pneumonia[4,12,13] and endocarditis[4,14-16]. There have been previous reports of *S. suis* peritonitis in pigs[17,18] but has never been reported in humans. The authors present their recent experience with a patient found to have *S. suis* peritonitis in a tertiary care center in Thailand.

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## CASE REPORT

A 45 year old male Thai truck driver with a history of eating raw pork was admitted following blunt abdominal injury in a car accident. He complained of generalized abdominal pain and developed paraplegia. His temperature on admission was 36.5°C, pulse rate was 112/minute, respiratory rate was 24/minute and blood pressure was 150/80 mmHg. The bowel sounds were decreased and the abdomen was tender with rebound tenderness. There was muscle injury with hematomas in both lower legs. The neurological examination revealed paraplegia with loss of anal sphinter tone and pin prick sensation below the first lumbar vertebral level. Deep tendon reflex was decreased at the lower extremities but Babinski's sign and ankle clonus were absent. Hemoglobin was 8.5 g/dl, platelets 206,000/$mm^3$, WBC was 12,000/$mm^3$ with 92 per cent neutrophils. Plasma glucose was 155 mg/dL, BUN 17 mg/dL, creatinine 1.2 mg/dL, serum sodium 139 mEq/L, potassium 5 mEq/L, chloride 104 mEq/L, total $CO_2$ content 15 mEq/L. Presumptive diagnosis of intraabdominal bleeding and possible compartmental syndrome of both lower legs and spinal cord injury were made. An exploratory laparotomy was undertaken and the patient was found to have a subadventitial tear of the aorta with blood clot covering whole abdominal aorta and pressure effect on the lower thoracic spine. There was ischemic necrosis of the transverse colon. A resection of the injured aorta with artificial graft replacement and resection of the necrotic transverse colon with end colostomy were undertaken. Double incision fasciotomy of both lower legs was also performed. Postoperatively, the patient was placed on a ventilator. He received ceftriaxone 1 gram intravenously every 12 hours and metronidazole 500 mg intravenously every 8 hours. On day 2 postoperatively, the patient developed rhabdomyolysis with acute renal failure and was hemodialysed. On day 8 postoperatively, he developed pneumothorax while on the respirator and a right intercostal drainage was inserted.Subsequently, he developed gangrene of both lower legs and underwent bilateral above the knee amputation. Hemoculture, urine culture and peritoneal fluid culture were done on day 9 and cloxacillin 1 gram was administered intravenously every 4 hours. The patient's abdomen became tender with rebound tenderness and he became hypotensive. He was given volume expander and vasopressive drug. However, his condition deteriorated and he expired on day 11. Neither a hemoculture nor a urine culture grew any organism but the peritoneal fluid grew alpha hemolytic Streptococcus on sheep blood agar and the organism was subsequently identified as *Streptococcus suis* serotype 2 by a substrate utilization test with the API 20 Strep System (API bioMerieux, sa, France). The antimicrobial suseptibility test was done by agar diffusion method.The organism was resistant to multiple antimicrobial agents including penicillin, intermediately susceptible to chloramphenicol and fully susceptible only to vancomycin. The minimal inhibitory concentration (MIC) of penicillin by E-test showed that the organism was highly resistant to penicillin (MIC>32mcg/ml).

## DISCUSSION

*Streptococcus suis* is an infectious agent which is found in pigs but seldom in humans[2-9]. The most pathogenic strain is serotype 2[2,3,19,20] which causes complications such as varying degree of hearing loss especially in patients with meningitis[4-10]. Infection by this organism may be underdiagnosed because the organism can be mistakenly identified as other organisms due to similar colony appearance[13]. Identification method of *S.suis* is not available in most microbiological laboratories[8]. One study reported the incidence of subclinical infection in pig farmers as high as 28 per cent[3] which suggests that *S. suis* infection may be more common than expected. *S. suis* infection can involve many organs[4-16] but according to the literature review, *S.suis* peritonitis in humans has never been reported. This case report is probably the first report of peritonitis caused by *S. suis* previous studies showing different ribotype profiles of *S. suis* had different patterns of infections and resistance to antimicrobial agents[19,20]. The major routes of entry of *S.suis* are usually *via* skin lesions [2,21] or skin injury[13]. Prompt first aid for skin injury can reduce the risk of infection[22]. Our patient had a behavior risk in contacting *S. suis* in that he ate raw pork quite often. His abdominal trauma could have allowed the organisms to penetrate from the abdominal surface into his abdominal cavity where it subsequently caused peritonitis. Another source of the organisms may be from hospital acquired infection.

Most cases of *S.suis* infection survive despite a severe clinical course[8] if the diagnosis

is made early and appropriate treatment is started without delay[13]. A high dose of intravenous penicillin G is recommended[2,4-10,13-15] but a protracted period of treatment may be required[4,10, 14,15,23]. Treatment may also be augmented with other drugs such as gentamicin[4,13,15]. Previous reports described *S. suis* with penicillin resistance. The first report described poor susceptibility to penicillin but a good response was obtained when penicillin was combined with chloramphenicol[24]. Another case of penicillin resistant *S.suis* but susceptible to ampicillin has been reported[25]. In our patient, the organism was highly resistant to penicillin G (MIC>32 mcg/ml) and was only susceptible to vancomycin.This may be explained by variant strains of *S. suis* or a different ribotype profile resistant to multiple antimicrobial agents[19,20]. Hence, it is sensible to try an alternative antimicrobial agent such as vancomycin with any patient suspected of having *S. suis* infection who does not respond to conventional antimicrobial agents.

In summary, *S. suis* infection may be more common than it was thought to be. *S. suis* can cause peritoneal infection in humans. There are strains of the organism that are resistant to multiple antimicrobial agents. Early detection of resistance and alternative antimicrobial agents such as vancomycin may be necessary for treatment.

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รายงานผู้ป่วยชายชาวไทย 1 ราย อายุ 45 ปี มีอาการเยื่อบุช่องท้องอักเสบ เนื่องจากถูกกระแทกช่องท้องจากอุบัติเหตุรถยนต์ ผู้ป่วยได้รับการรักษาโดยการผ่าตัด และได้ยาปฏิชีวนะ ceftriaxone และ metronidazole หลังผ่าตัดมีปัญหาไตวาย และได้รับการรักษาโดยการทำ hemodialysis วันที่ 8 หลังเข้ารับการรักษาในโรงพยาบาล ผู้ป่วยมีอาการของเยื่อบุช่องท้องอักเสบอีกครั้ง ร่วมกับมีภาวะความดันโลหิตต่ำ ซึ่งไม่ตอบสนองต่อการรักษา ผู้ป่วยเสียชีวิตหลังจากเข้ารับการรักษาในโรงพยาบาลเป็นเวลา 11 วัน ผลการเพาะเชื้อของน้ำในช่องท้องขึ้นเชื้อ *Streptococcus suis* ซึ่งดื้อต่อยา penicillin และยาปฏิชีวนะหลายชนิด ยกเว้น vancomycin (ค่า MIC ต่อยา penicillin มากกว่า 32 ไมโครกรัมต่อมิลลิลิตร)

**คำสำคัญ** : เยื่อบุช่องท้องอักเสบ, *เชื้อสเตร็ฟโตคอคคัส ซูอิส*, รายงานผู้ป่วย

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