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Scientific letters

Pyogenic intraventricular empyema owing to *Veillonella parvula* in a preterm infant[☆]



Empiema intraventricular piogénico por Veillonella parvula en un recién nacido prematuro

Anaerobic organisms are an exceptional cause of meningitis in preterm infants.¹ *Veillonella parvula* (*V. parvula*) is part of the normal flora of the pharynx, gastrointestinal tract, and female genital tract.² 20% of newborns are colonised by *V. parvula* at 4 weeks of life.³ Meningitis due to *V. parvula* is exceptional⁴ and only one case has been reported in infants. This was in a 6-week-old boy with a sacral dimple with tethered spinal cord.⁵ We present the first case of primary pyogenic intraventricular empyema caused by *V. parvula* in a preterm infant.

Male infant born at 29 weeks gestation weighing 1350 g. Born from a fifth pregnancy (3 prior abortions), monitored, with breakthrough bleeding in the first trimester. No urinary or vaginal infection symptoms reported. Normal delivery at 29 weeks. Apgar 8/9. At 36 h of life, the infant had hypovolemic shock secondary to bilateral grade III intraventricular haemorrhage and right frontoparietal periventricular haemorrhagic infarction that evolved into posthaemorrhagic ventriculomegaly, which was treated with serial lumbar punctures. At 19 days of life, he had septic symptoms with poor tolerance of food and abdominal distension, isolating Staph in a haemoculture. *Staphylococcus haemolyticus* being treated with meropenem. At 41 days of life he was transferred to our Neonatal Intensive Care Unit presenting intermittent fever, tense fontanelle of 4 × 4 cm, a head perimeter of 36 cm that increased 1.5 cm every 2 days and abdominal distension. In the neuroimaging tests (transfontanellar cerebral ultrasound and cerebral MRI) an increase in the size of the ventricular system was observed, more marked in the right ventricle which presented internal material that behaved as hyperintense on the weighted image in diffusion and hypointense on the apparent diffusion coefficient map, and behaved as a mass on the left hemisphere displacing the midline. External drainage was placed in the frontal horn of the right lateral ventricle from which yellowish-green fluid exuded (leukocytes 73,700/microl, PMN 61%, mononuclear 39%, red blood cells 136,000/microl, proteins 1950 mg/dl, glucose 0 mg/dl). No growth was observed in CSF cultures for aerobic bacteria and fungi, but *V. parvula* T X84005 was identified in 2 CSF samples by means of amplifying and sequencing a fragment of approximately 1500 base pairs of the rRNA gene 16S in 2 CSF samples, using the primers fd1 (5'-AGAGTTTGATCTGGCTCAG-3') and rp2 (5'-ACGGCTACCTGTACGACTT-3'). The sequences generated were compared with the existing ones in the GenBank database, using the

software BIBI (<http://pbil.univ-lyon1.fr/bibi>), obtaining a similarity of 99.5% with the *V. parvula* T X84005 sequence. Metronidazole was added for 8 weeks to the meropenem treatment, which had been started at the hospital of origin. In the cerebral MRI prior to discharge, normalisation of the right ventricular system was observed with large cystic encephalomalacia of the ipsilateral cerebral hemisphere.

V. parvula infections are very rare in children. Only rarely do they produce infections of the central nervous system and, to date, had not been reported as a cause of intraventricular infection in preterm infants.

In some of the cases of central nervous system infection due to other anaerobic germs described in newborns, the suspected entry point has been bacteraemia after a necrotising enterocolitis.⁶ In our case, it is likely that the source of the infection was also intestinal after the likely symptoms of necrotising enterocolitis that he had at 19 days of life; although it cannot be ruled out that the bacteraemia had been transmitted vertically from the colonisation of the mother's genital tract or iatrogenically via the lumbar punctures conducted to control the post-haemorrhagic ventriculomegaly.

Based on its rarity, there are no recommendations for the treatment of primary anaerobic intraventricular empyema. Based on the cases reported in adults, CSF drainage was conducted⁷ and treatment with metronidazole and meropenem was administered.⁸

This case illustrates the importance of obtaining aerobic and anaerobic cultures from CSF in cases of premature infants with central nervous system infection, especially if there is a history of necrotising enterocolitis, and emphasises the usefulness of molecular identification methods in infections caused by bacteria which are difficult to culture.

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***Ruminococcus gnavus* infection of a metal-on-metal hip arthroplasty resembling a pseudo-tumour in a 72 year-old woman with no intestinal symptoms**



Infección por Ruminococcus gnavus de prótesis de cadera metal-metal asemejando un pseudotumor, en una mujer de 72 años sin síntomas intestinales

A 72-year-old woman was referred to the emergency department of a tertiary hospital under suspicion of left total hip infection and/or urinary infection. The patient complained of dysuria and left groin pain of several days duration, as well as temperature up to 39.5 °C, with no trauma. She had been implanted with a metal-on-metal big-head total hip arthroplasty five years ago. Physical exam revealed pain with groin palpation and with passive motion, and she had difficulty to walk. Blood analysis showed 18,980 g/l leukocytes, 87% neutrophils, C-reactive protein 180 mg/l and procalcitonin 4.12 ng/ml. Intravenous empiric antibiotic treatment was begun with cephazolin 1 g/8 h, gentamycin 240 mg/24 h and clindamycin 600 mg/8 h. After 3 days urine culture yielded >100,000 CFU of *Klebsiella pneumoniae* and treatment was changed to oral amoxicillin-clavulanate 875 mg for 10 days. The patient improved clinically and returned to walk without hip or groin pain. Along the following two months she suffered three episodes of left hip dislocation treated conservatively with closed reduction under general anaesthesia. The radiographic control after the last episode showed incomplete reduction (lack of full seating of head inside cup). The total hip was surgically revised to a conventional metal-on-polyethylene because of suspicion of pseudotumor interposition inside the joint.

One-stage uncemented exchange was performed, but only the acetabular cup and the femoral head were replaced. At the time of surgery, all biochemical parameters resulted normal. The removed periarticular tissue was examined histopathologically by microscopy to confirm the presence of a chronic inflammatory process with coagulation necrosis, hemosiderin and replacement of normal tissue with scar tissue. Five intraoperative specimens were obtained for microbiological purposes: three tissue samples of the periarticular and intraarticular granuloma/pseudotumour, the retired prosthetic components (big head and old acetabulum), and bone tissue from the reaming of acetabular bone.

Specimens were aseptically collected and sent for microbiological analysis and culture within 2 h. All samples were processed independently. Microscopic examination of the samples showed an absence of polymorphonuclear cells and/or microorganisms. Saline solution was added to the biopsies prior to homogenization. Ultrasonication of the removed prosthetic implants was performed. The resulting suspensions obtained were plated onto 5% sheep blood Columbia agar medium incubated at 36 °C under aerobic and anaerobic conditions; onto Chocolate agar incubated at 37 °C in a 5% CO₂ atmosphere; and onto Schaedler agar + 5% sheep blood, Phenile-

tanol blood agar and Schaedler Neomycin Vancomycin agar + 5% sheep blood incubated at 36 °C under anaerobic conditions (all media were from bioMérieux, Marcy l'Étoile, France). Additionally, 1 ml of the suspensions were injected into a pair of aerobic and anaerobic culture bottles BACTEC Plus Aerobic/F and Plus Anaerobic/F incubated for 7 days in a BACTEC 9240 Blood Culture System (Becton Dickinson Microbiology Systems, Sparks MD, USA).

Four samples yielded positive cultures after 3 days of direct incubation on anaerobic conditions: the three granuloma/pseudotumor samples and the sonicate from the prosthetic components. Microorganisms appeared as translucent small colonies and Gram staining showed short Gram-positive diplococci. Few colony forming units grew from the direct solid medium and positive cultures were also obtained from anaerobic bottles from the granuloma/pseudotumor samples and from the prosthesis sonicate; the same colonies appeared in the subcultured anaerobic plates after 48 h.

The microorganism was identified as *Ruminococcus gnavus* (score: 2.2) by matrix-assisted laser desorption/ionization time of flight mass spectrometry, Maldi-TOF MS (Maldi Biotyper 3.0 System, Bruker Daltonics GmbH, Leipzig, Germany). The test was confirmed twice with the same result. Susceptibility of *R. gnavus* to antimicrobial agents was performed using agar diffusion epsilometer testing (Oxoid, Basingstoke, UK) on 5% sheep blood Columbia agar medium at 37 °C in anaerobic atmosphere. Minimum inhibitory concentrations (MIC) were determined for penicillin (MIC = 0.064 α/4g/ml), tigecycline (MIC = 0.064 α/4g/ml), vancomycin (MIC = 0.19 α/4g/ml) and linezolid (MIC = 1.5 α/4g/ml). It was also tested against amoxicillin-clavulanic acid, meropenem, clindamycin and metronidazole but results could not be interpreted due to a contamination and the strain could not be recovered from the frozen vial. According to the European Committee on Antimicrobial Susceptibility Testing criteria, the isolate was found to be susceptible to penicillin and vancomycin.

Intravenous empiric antibiotic treatment was begun with cephazolin 1 g/8 h, gentamycin 240 mg/24 h and clindamycin 600 mg/8 h during the immediate post operative period. Seven days later, de-escalation was done and oral clindamycin 600 mg/8 h along 6 months was prescribed by treating orthopaedic surgeries according to the protocols established in the Hospital.¹ At last revision in out-patient clinic (10 months post-surgery), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) resulted normal, the patient was absolutely asymptomatic, did not need any walking aid, climbed stairs and used public transportation, was able to walk up to 1 km without stopping, and showed no signs of left hip prosthesis dysfunction.

R. gnavus is a strictly anaerobic Gram-positive non-spore-forming coccus that may be motile or non motile. It belongs to the Clostridia class of the Firmicutes division. *R. gnavus* is found to be part of the intestinal flora in humans and in the rumen of animals such as sheep, cattle and goats.²

The only previously described human infections were two cases of bacteremia associated with diverticulitis in men,³ one case of total hip arthroplasty infection in a man with ulcerative colitis,⁴ and one case of septic arthritis⁵; all these infections were described in patients with gastrointestinal diseases. The patient