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ORIGINAL ARTICLE

NEONATAL SEPTIC ARTHRITIS IN A MALE NEONATE FOLLOWING LOCAL TRADITIONAL CIRCUMCISION IN NORTH CENTRAL NIGERIA: A CASE REPORT.

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Abstract

Septic arthritis is a bacterial infection of the joint space with the potential to cause damage or deformity of the joint, which is rarely reported in neonates. Bacterial organisms acquired via haematogenous spread from a remote location are mostly implicated, with large joints of the lower limbs being the most affected in a monoarticular form. This is a case report of a twenty-two-day-old term male neonate BS, who presented with fever, penile shaft infection following traditional surgical circumcision and progressive left knee swelling associated with limitation of movement. Surgical drainage of the arthritic purulent collection and culture-guided antibiotics treatment resulted in a remarkable improvement and an uneventful clinical course. This case is being reported to draw attention to the persistence of local traditional surgical practitioners in our community and the potential health hazards associated with their practice.

Keywords: **Traditional circumcision**, **Neonatal Septic Arthritis, Staphylococcus aureus, North Central Nigeria.**

Introduction

Septic arthritis (SA) is a joint space infection leading to inflammation of the synovial membrane with purulent effusion into the joint capsule.[1] Neonatal septic arthritis, though rare, is a devastating infection that can lead to severe joint deformity and septicaemic illness.[1,2] The commonly affected sites include the large joints of the lower limbs, and most infections are monoarticular.[3] The global incidence of neonatal septic arthritis is 12 in 100,000 live births.[4,5] It is common among low birth weight, preterm, male babies.[1,6] A variety of micro-organisms, including bacteria, fungi or viruses, have been implicated in the aetiology of septic arthritis; however, the majority of the infections are usually of bacterial origin, and *Staphylococcus aureus* is the commonest

causative organism in neonates.[5] In older children, Haemophilus influenza type B and Methicillin-resistant Staphylococcus aureus have also been implicated.[7,8] Septic arthritis often results from haematogenous spread of microorganisms from a remote septic focus, penetrating traumatic injury or spread from infection of a contiguous structure such as osteomyelitis.[9] Other reported sources include infection complicating umbilical catheterization and parental nutrition, especially in NICU babies.[5] The immature immune system of the neonate in addition to the thin loose periosteum of the bony cortex and the connectivity of blood vessels that supply the epiphysis and metaphysis facilitate these modes of acquisition of joint space infection while the rich vascular supply and lack of synovial basement membrane in the joints contribute to the clinical and pathologic changes seen in the disease.[10] Factors such as inadequate infection prevention measures, use of devices like ventilator, surgical wounds, and intravenous access are common potential sources of the causative organism in hospital care-associated infections (HAI).[11]The typical clinical presentation of fever, joint tenderness, swelling, limitation of movement in affected joint and pseudo paralysis may be missed in neonates because the signs are often masked by the general non-specific signs of sepsis.[1,12] Early diagnosis and prompt intervention are associated with good prognosis.[1,2]

Case summary: BS was a 22-day old male neonate delivered spontaneously per vagina at 39wks gestation to a 26years old para one mother and weighed 3.4kg at birth. He was presented to our facility, a secondary health care facility in North Central, Nigeria with a 5-day history of progressive left knee swelling, associated with limitation of movement and excessive crying that was noticed anytime the affected limb was touched. The swelling was noticed five days after he was circumcised by a traditional surgeon. He also had a high-grade continuous fever, and pus discharge from the circumcision site X and y days respectively before the joint swelling. The mother had applied motor vehicle lubricant as part of the post circumcision care. At the onset of the knee swelling, he was commenced on unknown oral antibiotics procured from a patent medicine shop. The swelling was also being massaged with warm water. When there was no response to treatment, parents decided to bring him to the hospital. There was no history of prolonged labour, traumatic delivery or need for vigorous resuscitation at birth. Significant findings at presentation included irritability, pyrexia (temperature, 38.9° Celsius), and a markedly tender erythematous, diffuse left knee swelling (in a flexed position) extending proximally to the thigh and distally to the ankle (Figure 1), which was warm to touch. There were multiple exudative pustules over the penile shaft. Weight on admission was 3.8kg. A diagnosis of neonatal septic arthritis of the left knee complicating post-circumcision penile shaft infection was made. The differential diagnosis included cellulitis and osteomyelitis. The initial investigation results showed leukocytosis with neutrophilia, thrombocytopenia, elevated Erythrocyte sedimentation rate, ESR (35mm/hr) and C - reactive protein (85.4mg/dl). Blood culture and culture of exudates from the penile shaft both yielded coagulase-negative Staphylococcus aureus, sensitive to Cloxacillin. Serum electrolytes were normal. Investigation results are as shown in Table 1 below

Table 1: Investigation resultsInvestigation

Result	Comment						
Full blood count	14/5/21	16/5/21	21/5/21	25/5/21	31/5/21	4/6/21	
Packed cell count	47%	40%	37%	27%	31%	37%	Anaemia
Hb(g/dl)	15.6	14	12.4	9 g/dl	10.3	12.3	
White Blood Cell count (x109/l)	25.6	20.4	18.6	15.6	25.6	9.6	Elevated
Platelets(x109/l)	100	125.6	152.4	158	240	261	
Neutrophil	86%	75%	69%	62%	65%	54%	Elevated
Lymphocytes	12%	22%	28%	32%	36%	44%	Elevated
Erythrocytes sedimentation rate	35mm/hr			20mm/hr			
Blood and penile shaft culture	Moderate growth of Coagulase -negative Staph,. aureus						
C-reactive protein	85.4mg/dL				20mg/dL		Elevated
Sodium (Na)	135mmol/l						- Normal
Potassium(K)	4.0mmol/l						-
Chloride(Cl)	97mmol/l						-
HCO3	22mmol/l						-
Urea(Ur)	2.5mmol/l						-
Creatinin(Cr)	62.9 µmol/l						

Plain radiograph (Figure 2) of the affected knee showed widening of the joint space and soft tissue swelling while the ultrasound scan showed a large echo-rich collection. Measuring approximately 30.1 x 23.2 x 17.8mm with an estimated volume of 6- 10 mLs. The underlying bones, including the distal femoral and proximal tibia epiphyses, were normal. The baby had surgical exploration and drainage of purulent arthritic fluid, which also yielded the same organism as previously isolated from blood culture. He was treated with antibiotics (Cloxacillin) for 6 weeks. Additional treatment included, blood transfusion for anaemia (PCV had dropped from 47% to 25% over a period of 11days). He responded remarkably well to treatment and was discharged home with a weight of 3.94kg for follow-up at the Paediatric, Orthopedic and physiotherapy clinics. Figure 3 shows the post-surgical scar. The child is now able to walk with no knee deformity.

Figure 1: At presentation swollen tender left knee

Figure 2: Plain Radiograph of the affected left knee

Figure 3: Left Knee after surgery showing healing surgical scar

Discussion: The case, like previous reports, was a male who presented with typical signs and symptoms of neonatal arthritis of the left knee joint, which included fever, irritability and tender swelling of the affected joint with limitation of movement.[1,9] The radiologic and ultrasound examination of the joint was in keeping with the diagnosis of arthritis, while the microbial yield from the purulent joint fluid confirmed the infective aetiology. Fever is a non-specific sign in septic arthritis, and has a short onset of duration as reported by Sreenivas et al,[13] and demonstrated in our patient. The most likely primary source of joint infection was the penile shaft infection, which arose from unhygienic traditional surgical circumcision. Unhygienic surgical procedures are not uncommon in Nigeria, especially in rural communities. Jimoh et al[14] in a cross-sectional community-based study in Zaria, Nigeria reported that 81.5% of mothers interviewed admitted that their babies had undergone at least one form of unhygienic surgical intervention, the most common being female circumcision and uvulectomy. These traditional surgical practices are more susceptible to untoward effects than those carried out by trained/skilled surgeons. In a systematic review of the literature on complications of circumcision, Weiss et al[15] reported a higher rate of severe adverse events among circumcision performed by untrained local surgeons. This, however, contrasts with the findings of Myers et al[16] and Okeke et al from Southern Nigeria, where traditional circumcision is reportedly associated with fewer complications probably as a result of adopted positive modifications over time.

We speculate that traditional circumcision resulted in infection of the penile shaft because conventional antiseptic measures were not applied, and therefore, adequate infection control could not be guaranteed. The role of car lubricant applied on the glans penis post-circumcision as a source of bacterial contamination cannot be substantiated. Coagulase-negative Staphylococcus aureus, which was isolated in our patient, is the most common organism reported in septic arthritis in the literature.[5,6,7] Yasir et al reported a case of severe gram negative septicaemic illness in a neonate following circumcision conducted by untrained circumcisers in Pakistan.[18]

Intravenous antibiotics is advocated for the treatment of septic arthritis and this can last for up to six weeks depending on the severity of the disease and the causative organism. Surgical intervention, particularly arthrotomy

to drain the pus, is the usual practice, and physiotherapy helps to stretch the tendons and prevent contractures.[11] Early diagnosis and prompt intervention is associated with a good prognosis.[1,2] The parental decision to seek orthodox intervention soon after the symptoms were noticed contributed to the successful outcome of management in the index patient.

In developing countries, including Nigeria, traditional surgical practices are quite prevalent,[19] rooted in culture and tradition[20] in addition to being an income-generating vocation.[21] Although clearly associated with complications such as infections, haemorrhage, chronic arthritis with joint deformity[20] and penile shaft amputation,[22] any attempt to discourage these practices would expectedly be resisted; therefore, community sensitization to ensure practice modification for enhanced safety would be a better approach to mitigate this societal problem.

Our patient had prompt diagnostic and therapeutic arthrotomy, received antibiotics based on microbial isolate and susceptibility tests as well as timely physiotherapy resulting in an impressive outcome. Early diagnosis and appropriate multidisciplinary intervention is reportedly associated with good outcomes in patients with septic arthritis,[1,12] However chronic polyarticular septic arthritis with joint deformity was associated with traditional 'initiation circumcision' in a young South African adult necessitating orthopedic intervention, prolonged joint mobilization and physiotherapy.[20]

Conclusion: Although neonatal septic arthritis is uncommon, it may result from septic unorthodox surgical practices. We therefore recommend continuous health education to discourage harmful, unorthodox health-related practices in our communities.

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Consent- Verbal consent was obtained from the parents.

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