Continuous suction and intermittent irrigation for septic coxitis

Ashok Biyani[1] and Jagdish Chandra Sharma[2]

This prospective study was undertaken on 42 children with septic arthritis of the hip diagnosed within 5 days of onset of symptoms. The mode of treatment used was continuous catheter suction and intermittent saline irrigation of the hip joint together with parenteral antibiotics. All but 4 children responded to this treatment; 2 of these were less than 3 years old. We conclude that continuous suction-irrigation is effective in children older than 3 years very early in the course of the disease; the majority need not undergo arthrotomy.

In the management of septic arthritis in children, most authors recommend immediate arthrotomy (Paterson 1970, Morrey et al. 1976, Griffin and Green 1978, Paterson 1978, Aronoff and Scoles 1983). Some authors initiate the treatment with needle aspiration, particularly for joints other than the hip (Goldenberg et al. 1975, Goldenberg and Cohen 1976, Herndon et al 1986). Recently, Wilson and Di Paola (1986) have concluded that needle aspiration is effective when the treatment is started within 4 days of onset of symptoms.

We report the results of continuous catheter suction and intermittent saline irrigation in the management of septic coxitis in children.

Patients and methods

The study was conducted on 42 children with septic arthritis of the hip, treated at the M. G. Hospital between January 1984 and December 1986. Only those who had symptoms for 5 days or less were included; children with a longer duration of symptoms were subjected to immediate arthrotomy.

The age of the children ranged from 6 months to 13 years (Table 1); whereas 32 children were older than 3 years only 1 was younger than 1year, because we preferred arthrotomy in infants.

Departments of Orthopedics, All India Institute of Medical Sciences[1], New Delhi, and M. G. Hospital[2], Jodhpur, India

Correspondence: Dr. Ashok Biyani, 88, Ayurvigyan Nagar, Andrews Ganj, New Delhi-110049, India

Table 1. Clinical data from 42 children with septic hip arthritis

Age (yr)	Boys	Girls	Failures
1–3 [a]	7	3	2
4–6	9	6	
7–9	5	3	1
10–13	5	4	1
	26	16	4

[a] 1 infant included

All the children had systemic symptoms with irritability, lethargy, continuous high fever, and pain and swelling in the hip region with painful restriction of hip motion. A positive culture of the joint fluid, positive gram stain or white blood cell count of more than 50,000/mm^3 in the joint fluid were taken as diagnostic of septic coxitis (Goldenberg et al 1975, Herndon et al. 1986). Twenty-eight children fulfilled all three criteria, 12 children two criteria, and 2 only one criterion.

All the children had a WBC count of more than

Table 2. Types of the organisms isolated

Organism	Number of patients
Staph. aureus	22
H. influenzae	7
Streptococci	3
Coliforms	2
None	8
	42

13,000/mm^3 and an ESR of more than 25 mm/h. The average joint WBC count was 84,000/mm^3. *Staphylococcus aureus* was the most common infecting organism (22/42). *Hemophilus influenzae* was isolated in 7 children (Table 2). Positive blood cultures were found in 20 children, whereas culture of joint fluid was positive in 34 children.

On admission intravenous ampicillin and cloxacillin were started. In the operating room under general anesthesia, a noncollapsible plastic intravenous catheter (Venflon, 16 or 18 gauge) was introduced anteriorly into the affected hip under image-intensifier control. On removal of the stylet, the joint was aspirated. The aspirate was sent for culture and sensitivity, gram staining, and WBC counting. The joint was then lavaged with saline three to four times. The catheter was left in situ taped to the skin. and was connected through a plastic tubing to the suction pouch. On returning the patient back to the ward, the joint was irrigated with saline three to four times a day. Below-knee skin traction was applied in all the cases.

Spontaneous partial extrusion of the cannula occurred in 3 of the first 10 cases. However, reintroduction of the cannula was not necessary, because each of these children had improved clinically by then. The problem of extrusion was overcome later in the study by meticulous taping of the cannula.

In those children who responded well to the treatment, the catheter was removed after 2 to 3 days. Children not showing substantial improvement in general and in their local condition within 48 hours were subjected to arthrotomy.

Appropriate antibiotics were selected according to culture and sensitivity reports. Parenteral antibiotics were continued for 14 days after which the patient was discharged from the hospital. Oral antibiotics were continued for a further 2 weeks. Skin traction was discarded at the time of discharge.

Observations and results

Thirty-eight children responded well to suction and intermittent irrigation treatment. Thirty-six of these patients, who were followed up for 1–3 years, were clinically and radiographically normal. The 2 children who did not attend the final follow-up were asymptomatic at the time of their last visit at the hospital 5 and 8 months after the initial treatment.

Four children did not respond satisfactorily and were subjected to arthrotomy, two of whom were below 3 years of age. Three of them had *Staphylococcus aureus* and one had *Hemophilus influenzae*. Two of the children with a *Staphylococcus aureus* infection had resistance to both ampicillin and cloxacillin, whereas the third had only partial sensitivity to cloxacillin. These three children were sensitive to cephaloridine, which was then administered intravenously. *Hemophilus influenzae*, isolated in the fourth child, was sensitive to both ampicillin and cloxacillin. Two of these 4 children were clinically and radiographically normal at 6 and 14 months, respectively, and 1 child had a painless, full range of hip movements; but they all showed radiographic evidence of coxa magna at the 3-year follow-up. The fourth child had limitation of hip movements with radiographic joint destruction at 8 months.

Discussion

The most important determinants of good results following hip infection are early diagnosis, early institution of parenteral antibiotics, and hip decompression. However, decompression of the infected hip is accompanied by several problems. Needle placement inside the joint may be difficult, aspiration may not remove thick pus (Paterson 1970) and fibrin exudate (Curtiss 1973), and adequate drainage of all the synovial recesses of the joint is not always possible (Morissy 1982). Sometimes repeated needle aspirations are required, which can be painful to the child. Moreover, it may not be practical to aspirate the joint every time the fluid reaccumulates (Morissy 1982).

Continuous suction overcomes most of the drawbacks of needle aspiration. The intermittent saline irrigation dilutes the infective material inside the joint and removes it effectively. Similarly, the destructive enzymes are repeatedly washed away, thus minimizing the harmful effects of pus and fibrin clots.

It is not necessary to instill antibiotics into the joint because parenteral administration of antibiotics provides sufficient concentration in the joint fluid (Nelson 1971). Further, intraarticular administration of antibiotics may irritate the articular cartilage (Paterson 1970, Reudy 1973, Morissy 1982).

In the present study, unresponsiveness to suction-irrigation treatment did not appear to be related to the type of organism grown. Herndon et al. (1986) and Wilson and Di Paola (1986), however, concluded that a *Staphylococcus aureus* infection was more difficult to eradicate. In both of these studies, *Hemophilus influenzae* was the most common organism in acute pyogenic coxitis in children, whereas *Staphylococcus aureus* was the most commonly isolated organism in our series.

Two of our children requiring surgical drainage were under 3 years of age. Other reports also indicate

that septic coxitis in children younger than 3 years of age, usually infants, requires vigorous treatment (Morrey et al. 1976, Newman 1976, Wiley and Fraser 1979, Wilson and Di Paola 1986).

We conclude that continuous suction and intermittent irrigation are a good alternative to arthrotomy in the treatment of septic coxitis in children older than 3 years of age provided the treatment is commenced within 5 days of the onset of symptoms.

References

Aronoff S C, Scoles P V. Treatment of childhood skeletal infections. Pediatr Clin North Am 1983;30(2):271–80.

Curtiss P H Jr. The pathophysiology of joint infections. Clin Orthop 1973;96:129–35.

Goldenberg D L, Brandt K D, Cohen A S, Cathcart E S. Treatment of septic arthritis: comparison of needle aspiration and surgery as initial modes of joint drainage. Arthritis Rheum 1975;18(1):83–90.

Goldenberg D L, Cohen A S. Acute infectious arthritis. A review of patients with nongonococcal joint infections (with emphasis on therapy and prognosis). Am J Med 1976; 60(3):369–77.

Griffin P P, Green W T Sr. Hip joint infections in infants and children. Orthop Clin North Am 1978;9(1):123–34.

Herndon W A, Knauer S, Sullivan J A, Gross R H. Management of septic arthritis in children. J Pediatr Orthop 1986; 6(5):576–8.

Morrey B F, Bianco A J, Rhodes K H. Suppurative arthritis of the hip in children. J Bone Joint Surg (Am) 1976; 58(3):388–92.

Morrissy R T. Bone and joint sepsis in children. Instr Course Lect 1982;31:49–61.

Nelson J D. Antibiotic concentrations in septic joint effusions. N Engl J Med 1971;284(7):349–53.

Newman J H. Review of septic arthritis throughout the antibiotic era. Ann Rheum Dis 1976;35(3):198–205.

Paterson D C. Acute suppurative arthritis in infancy and childhood. J Bone Joint Surg (Br) 1970;52(3):474–82.

Paterson D. Septic arthritis of the hip joint. Orthop Clin North Am 1978;9(1):135–42.

Ruedy J. Antibiotic treatment of septic arthritis. Clin Orthop 1973;96:150–1.

Wiley J J, Fraser G A. Septic arthritis in childhood. Can J Surg 1979;22(4):326–30.

Wilson N I, Di Paola M. Acute septic arthritis in infancy and childhood. 10 years experience. J Bone Joint Surg (Br) 1986;68(4):584–7.