

# CASE REPORT

ONLINE EXCLUSIVE

## > THE PATIENT

4-year-old girl

## > SIGNS & SYMPTOMS

- Limited movement in both arms
- Diffuse pain in elbows, forearms, and upper arms
- Pronated hands

**Robert N. Anderson, DNP, APRN, (F)NP-C, ENP-BC; Mark F. Riederer, MD**  
Vanderbilt University Medical Center, Department of Medicine–Walk In Clinics, Nashville, TN (Dr. Anderson); Department of Orthopaedic Surgery, University of Michigan, Ann Arbor (Dr. Riederer)

[bob.anderson@vumc.org](mailto:bob.anderson@vumc.org)

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## > THE CASE

A 4-year-old girl was triaged to the Pediatric Emergency Department (PED) Fast Track, complaining of pain and limited movement in both arms. For an unknown reason, she had attempted to lift a heavy, 3-person sofa several hours earlier.

Her prior medical history included left nursemaid elbow (NME) at both 15 months and 33 months of age. Neither event had a known mechanism of injury. In both episodes, it was noted in the medical record that the child was not using her arm, “was holding it funny,” and was complaining of pain. Each time, she presented about 24 hours after symptom onset.

During the physical exam in the PED, the patient showed no signs of acute distress. She held both arms close to her body, with a slight flexion at the elbows, and her hands were pronated. She could not pinpoint the location of her discomfort and described diffuse pain in her forearms, elbows, and upper arms. Examination revealed no localized pain or tenderness in her hands, wrists, or clavicles. Radial pulses were easily palpated, and capillary refill was less than 2 seconds. There was no swelling or bruising. The rest of her physical exam was normal.

## DIAGNOSIS

The patient was given a diagnosis of self-inflicted bilateral nursemaid elbows (BNME). Reductions were performed by individually stabilizing the elbows and hyper-pronating the forearms, with palpable clicks felt at the proximal radius. Even though a palpable click was felt, this motion was immediately followed by supination of the forearm and flexion at the elbow. The patient tolerated the procedures well and was using both arms normally within 10 minutes. She was discharged home shortly thereafter.

## DISCUSSION

BNME is an uncommon diagnosis; a literature review of reported cases indicates none were self-inflicted.<sup>1-4</sup> However, NME is a common injury and is easily reduced. The classic mechanism of injury for NME involves the elbow in extension, while the forearm is pronated, and a sudden brisk axial traction is applied. This combination of motions causes the annular ligament to slip over the head of the radius and become displaced downward into the radiohumeral joint, where it becomes entrapped. In this case, the patient apparently exerted enough longitudinal traction while trying to lift the couch to produce the injury.

NME occurs most commonly in the left arm of girls between the ages of 4 months and 7 years and peaks at around the age of 2 years.<sup>5</sup> A 2014 study by Irie et al<sup>6</sup> corroborated the findings on left-side predominance and increased incidence with age, noting that frequency of injury peaked at 6 months in those younger than 1 year of age and at 2 years for those 1 year or older. However, the researchers found no significant sex difference.<sup>6</sup>

NME is radiographically indistinguishable from a healthy elbow.<sup>7</sup> To prevent unnecessary expense and radiation exposure in young children, preradiation radiographs should only be used to rule out the possibility of fracture or other injury.<sup>7</sup> Krul et al<sup>8</sup> recommend restricting x-ray use to cases with an unclear history or those that are due to trauma other than an arm pull.

**■ Methods of reduction.** Once NME is diagnosed, there are 2 methods of reduction: hyper-pronation and supination-flexion. Reduction is best performed with the child sitting in the parent's lap with the injured arm facing the examiner.

Success rates for both methods of NME reduction are statistically similar; however, first-attempt success rates are significantly higher with the hyper-pronation method than with supination-flexion.<sup>9</sup> Furthermore, physicians have deemed the hyper-pronation method significantly easier to perform than supination-flexion.<sup>9</sup> A Cochrane review by Krul et al<sup>10</sup> concluded that the hyper-pronation method may result in lower failure rates than supination-flexion, but due to limited evidence, the researchers were unable to draw any conclusions on other outcomes, such as pain. Green et al<sup>11</sup> noted that hyper-pronation is perceived by parents of children with NME as being less painful. For these reasons, hyper-pronation should be utilized as the first method of reduction, followed by supination-flexion if the former does not work.<sup>12</sup>

**■ Additional management.** In a limited study of 50 children with pulled-elbow injuries, ultrasound revealed that 78% had an intact yet interposed radial annular ligament and 22% had a tear in the radial annular ligament.<sup>13</sup> The authors propose that if, after appropriate reduction methods are attempted, no pop is felt, or there is no prompt clinical improvement, and ultrasound is not available to assess the integrity of the annular ligament, the child should be placed in a splint for 7 days and referred for orthopedic intervention.<sup>13</sup>

**■ Our patient** returned to the PED 3 days later, complaining of pain and an inability to move her left arm after her older

sibling pulled her by her outstretched arms. She was once again diagnosed with NME, the injury was reduced, and she was using the arm within minutes. She has not presented to either the PED or the pediatric clinic with a similar complaint since. Discarding outliers, NME recurrence rates fall within a range of 23.7% to 32.9%.<sup>14,15</sup>

## THE TAKEAWAY

Pre-reduction x-rays are not warranted in cases of NME unless there is suspicion for fracture or another injury. The 2 reduction methods, hyper-pronation and supination-flexion, are easily mastered. Any reduction should be quick, easy, and as painless as possible. Hyper-pronation should be utilized first, as this maneuver seems to be the more successful and is perceived by parents as being less painful. However, it is always most helpful to be proficient in both methods. If, after appropriate attempts at reduction, the child has not regained the use of the arm, 7 days of splinting is recommended, along with an orthopedic referral. **JFP**

### CORRESPONDENCE

Robert N. Anderson, DNP, APRN, (F)NP-C, ENP-BC, Vanderbilt Health, 512 Autumn Springs Court, Suite 100 C, Franklin, TN 37067; bob.anderson@vumc.org

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Nursemaid's elbow is radiographically indistinguishable from a healthy elbow.

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