Treat Bone Injuries Early in Brain Trauma Patients

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BUENOS AIRES — Treatment of orthopedic injuries in patients with traumatic brain injury should not be delayed, Dr. Ivan Rubel said at the annual conference of the International Society of Orthopaedic Surgery and Traumatology.

A population-based study conducted in the Twin Cities area of Minnesota found that most patients who were seen in an emergency department for traumatic brain injury had received the injury from sports and recreational activities (Minn. Med. 2006;89:40-4). The traumatic brain injuries that trauma surgeons are more likely to encounter, however, come from falls or car accidents, said Dr. Rubel, director of the orthopedics and traumatology department at FLENI Institute in Buenos Aires.

Pelvic and extremity fractures are common in patients with traumatic brain injury. Many skeletal injuries are not given priority, or might even be missed. However, as the survival rate of patients with traumatic brain injury has increased, there is a greater emphasis on minimizing dysfunction and disability in these patients, particularly when the dysfunction and disability arise from concomitant orthopedic trauma.

In a study of health-related quality of life in pediatric patients during the first year following a traumatic brain injury, the treatment of associated injuries was shown to have a greater impact than other factors such as patient or family characteristics (Arch. Pediatr. Adolesc. Med. 2006;160:252-60). "With the recent advances in intensive care medicine, most of these patients survive," said Dr. Rubel. "We have to focus on minimizing the dysfunction and disability."

The main question concerns when to operate on orthopedic injuries in a patient with traumatic brain injury, explained Dr. Rubel. Early fracture fixation in blunt trauma patients is generally recommended, but many doctors are hesitant to perform early fixation in patients with severe brain trauma. There is a widespread view that fracture fixation should be postponed to protect the injured brain.

This view was challenged by a study examining the timing of fracture fixation in blunt trauma patients with severe head injuries (Am. J. Surg. 1998;176:324-9). Investigators reviewed records of 47 consecutive blunt trauma patients with both severe head injuries and long bone fractures requiring surgical fixation. Twenty-two patients had undergone early fracture fixation within 24 hours of hospital admission (mean time 17 hours), and 25 patients had undergone delayed treatment (mean time 143 hours). Review of patient records revealed that there were no significant differences between the two groups in terms of neurologic or orthopedic complications, length of hospital stay, or mortality. Thus, delay of fracture fixation did not protect the injured brain in this study population.

Dr. Rubel described a young patient who was treated at FLENI Institute for a severe traumatic head injury and multiple fractures. The head injury required decompression with a wide craniotomy. The patient remained in a coma for 6 weeks, and CT scans showed cerebral edema. Radiography revealed a huge intrapelvic calcification affecting the bladder and rectum, malunion of the pelvis, malunion of the tibia, and a radio-ulnar synostosis. She was placed in long arm and leg casts and was told that she could not have pelvic surgery because of the likelihood that she would die during the procedure.

"Once at our institution, the malunion of the tibia was corrected upon admission, and she was allowed to exercise on a rehabilitation bicycle," said Dr. Rubel. The second step was resection of the forearm synostosis, which improved the position of the hand for daily activities and allowed her to rehabilitate her writing capabilities, he said. As the brain edema resolved, the patient gradually improved both in cognition and in function. Restoration of the pelvic malunion with serial osteotomies was the last surgical intervention.

"It's hard for patients to understand not to put weight on the leg, since the brain is still inflamed," said Dr. Rubel. Rehabilitation was performed in a pool with chest-deep water. At 6 months from the accident, she returned to her normal activities.

Immediately after trauma, there is a window of opportunity when treatment of orthopedic injuries is optimal. Use that window of opportunity around trauma and start helping the patients right away to minimize their skeletal and psychological and cognitive dysfunction, advised Dr. Rubel. ■