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EMERGENCY TIPS

J.S. Surpure

Cardiac Contusion

Cardiac contusion secondary to blunt thoracic trauma is an important entity that has been recently characterized in the adult patient population. The frequency of cardiac contusion in pediatric patients who sustained significant blunt thoracic trauma has not been reported previously. Ildstad *et al.*(1) retrospectively studied 7 patients ranging in age from 2 to 18 years who had rib fractures or pulmonary contusion.

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Serial cardiac enzymes, serial electrocardiograms, and multiple gated acquisition (MUGA) cardiac scans were performed.

One child was injured as a passenger in a motor vehicle accident, five were struck by automobiles as pedestrians and one sustained traumatic asphyxia when a car, supported by a jack, fell on his chest. Three of the 7 patients (43%) had a significant cardiac contusion defined by abnormal right of left ventricular wall motion and a decreased ejection fraction on MUGA scan. The presence of contusion was confirmed by increases in cardiac enzymes and isoenzymes. However, in contrast with the typical adult with cardiac contusion, no child had ECG abnormalities. Two of the three patients with cardiac contusions underwent emergency operative procedures, and no complications occurred attributable to the myocardial contusions. One of the three patients underwent a repeat MUGA scan three weeks following the initial injury, and myocardial function had returned to normal.

The flexibility of the rib cage in the child is believed to make rib fractures much less likely than in adults, even after a significant blunt impact. Although all three patients in this series with cardiac contusions had associated pulmonary contusions, only two had rib fractures as well. Therefore, the authors recommend that pulmonary contusion, in addition to rib fractures, be used as an indicator of suspicion for concomitant cardiac contusion in pediatric trauma patients. While cardiac enzymes and isoenzymes require hours to days for availability, the MUGA scans can be performed at the bedside immediately following the injury, yielding immediate results.

This limited series suggests that cardiac contusion may occur frequently in children who have suffered from blunt thoracic

trauma significant enough to result in pulmonary contusion. Further studies will be required to determine the clinical significance and long-term consequences of traumatic myocardial damage in the pediatric population.

Chest X-ray Correlates

When children are admitted to the hospital with clinical signs of pneumonia or bronchiolitis, a chest X-ray is generally obtained and the findings are often an important factor when antibiotic treatment is considered. What chest X-ray evidence is helpful clinically? Friis *et al.*(2) correlated chest X-ray findings in the acute stage of pneumonia or bronchiolitis in 128 children under seven years of age with the results of bacteriological and virological investigations.

Twenty-six (20%) were under six months of age. Seventy-six children had a virus infection diagnosed by examination of nasopharyngeal secretion and/or serological methods. Thirty-seven of these children were classified as also having pathogenic bacteria of importance in the respiratory tract. Four groups of children were compared: Virus-infection children with or without bacteria in the secretions and the corresponding virus-negative groups. The chest X-rays were normal significantly more often in the virus-positive/bacterial negative group compared with the other groups. Alveolar pneumonia appearing as lobar or segmental consolidations was observed with equal frequency and without relation to bacterial findings in the virus positive and the virus negative groups. However, alveolar pneumonia was more often observed in the respiratory syncytial virus (RSV) infected children under 6 months of age, compared with the older

RSV children. Scattered alveolar infiltrations ("bronchopneumonia") most commonly appeared in the virus-positive group. There was no significant difference in the chest X-ray appearances in the groups with and without bacterial findings in the tracheal secretions except for a higher frequency of normal chest radiographs in the bacteria-negative group. No specific radiological abnormality was related to positive bacterial findings in nasotracheal secretions either in the virus positive or virus negative groups.

This study does not support the practice of acute radiological examination of all children with clinical suspicion of bronchiolitis or pneumonia. However, the authors recommend caution concerning RSV infected infants under six months of age, as they had segmental consolidations more often than the older children with RSV infections.

Limping Tots

The evaluation of acute gait disturbances in children is arduous and onerous. The universal concern is identifying significant infections such as septic arthritis and osteomyelitis as the underlying etiology. How prevalent is septic arthritis in causing an acute limp? What is the most efficient diagnostic method of determining an infectious etiology? These questions were addressed by Choban and Killian(3). A retrospective study was conducted on 60 consecutive children aged <5 years who were hospitalized for the evaluation of a new onset limp or refusal to bear weight. No child had a history of trauma. Physical examination revealed painful range of motion as well as joint tenderness. Most (73%) of the children had an antalgic limp or gait analysis, and the remaining 27% of the

children refused to bear any weight on the affected leg. The hip was the most common site (47%) of pathology.

It was observed that 14 patients (23%) had a significant infections accounting for the acute limp. An analysis of the infectious etiologies revealed that 6 (10%) had septic arthritis, 5 (8%) had osteomyelitis, and 1 (2%) had discitis. It is noteworthy that of these 14 patients with an infectious determinant; only 57% were febrile, 50% had a leukocytosis ($>12,000$ WBC/mm³), and 79% had an elevated ESR of greater than 20 mm/hr. Joint aspiration was very beneficial (69%) in identifying infectious etiologies.

The authors conclude that the evaluation of an acute limp should include a complete blood count, ESR, radiographs, blood culture and a diagnostic arthrocentesis. The joint aspiration was felt to be the most beneficial and effective tool in determining an infectious etiology for a new-onset limp.

Aching Backs

A painful back without a history of trauma is an infrequent reason for children and adolescents to seek medical attention. What is the incidence of atraumatic back pain in children? More important what is the etiology for this atraumatic back pain? Turner *et al.*(4) investigated this issue by reviewing the charts of children and adolescents who were referred to pediatric orthopedic surgeons for evaluation of back pain without antecedent trauma.

The authors discovered that the number of such referrals was only 61 children over a 6-year period and reflected only 2% of their non-trauma referrals. Surprisingly, 50% of these 61 referrals were found to have serious spinal disease. Those with

significant pathology ranged from vertebral osteomyelitis, infective discitis to Scheuermann's disease.

It is noteworthy that the authors could not reliably identify those children with serious spinal diseases based upon physical examination alone. It was felt that plain radiography of the spine was quite helpful as well as being accessible.

In the absence of a focal neurological deficit, the patients were treated conservatively and observed upon their response to such conservative measures. Further studies such as a CT and/or a myelogram were obtained only after a failure to respond to such measure.

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