Managing a Traumatic Pneumothorax

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TRAUMATIC PNEUMOTHORAX is a rare athletic injury, and the condition can be missed after a rib injury if subtle signs and symptoms are not recognized. Although most pneumothorax injuries can be managed conservatively, an undiagnosed pneumothorax can be life threatening. Returning to play too early can lead to progression of the pneumothorax; therefore, the medical staff needs to be aware of this condition to properly treat it. Because of its rarity, there are only limited, mostly anecdotal, guidelines dealing with return to play. This column presents two cases suggesting possible return-to-play criteria.

Signs and Symptoms

A traumatic pneumothorax presents the symptoms of shortness of breath, chest pain, hyperresonance to percussion of the affected side, and diminished breath sounds. Most patients with a traumatic pneumothorax have signs of direct blunt trauma, and the most common clinical symptom reported by patients is chest pain. Pain is usually localized to the area of the involved lung, with occasional radiation to neck, abdomen, or lower back. Approximately 10% of patients with a pneumothorax will be asymptomatic at the time of the initial evaluation; therefore, auscultation and X-ray are required for definitive diagnosis.

Case History

Case 1

A 20 year-old college football wide receiver reported to the athletic trainer during practice complaining of shortness of breath, scapular pain, and chest pain. He said he had dived for a pass and landed on the ball, and he went on to finish practice. The athlete had no prior health or medical concerns. The team physician evaluated him 24 hr after the injury and sent him for an X-ray, which indicated a suspected pneumothorax. The team physician consulted with a pulmonologist, who diagnosed a 20–30% pneumothorax. The athlete was immediately admitted to the hospital to reexpand the lung through a chest tube. He remained in the hospital for 3 days. The pneumothorax eventually resolved.
The return-to-play plan for the athlete was conservative. He was held out of contact sports for a period of 3 weeks and permitted to participate in conditioning and individual drills to his tolerance. After the team physician reviewed an X-ray at 3 weeks, it was decided that satisfactory healing had taken place. The athlete was released to full contact but was required to have X-rays taken every week for the next month to monitor his status.

Case 2
A 22-year-old college football quarterback reported to the athletic training room 2 days after a game complaining of shortness of breath and chest and back pain. He denied any injury or trauma to his chest during the game. Two weeks earlier, however, the athlete had been removed from a game after injuring his ribs when speared from the side as he was running with the football. He was evaluated on the sideline and referred for x-rays, which were negative.

The team physician evaluated him again after his symptoms appeared. The exam was normal, but the physician ordered a chest X-ray to be cautious. A series of X-rays were taken during the course of the week, and a radiologist diagnosed a <5% pneumothorax. The athlete was immediately referred to a pulmonologist. The pulmonologist was doubtful that he had a pneumothorax. He reviewed the X-ray and suggested that the lung had spontaneously expanded. He consulted with his partner, who agreed that the athlete did not have a pneumothorax. The athlete was released and cleared to resume football practice, but he was advised not to participate in contact until the weekend’s game. He participated in the next game without incident.

Two weeks after reporting his initial symptoms, the athlete reported to the athletic training room stating that he had chest discomfort, particularly with running. He was sent to the health center for a chest X-ray. The team physician reviewed the chest film and saw a large left-sided pneumothorax. He immediately referred the athlete to the pulmonologist for evaluation. The pulmonologist found multiple areas of ecchymosis on the left side with diminished breath sounds and diagnosed this as a 50% pneumothorax (Figure 1). The cause of the pneumothorax was undetermined but postulated to be trauma received during the preceding weekend’s game or a slow progression of a minuscule pneumothorax that had been barely noticeable on the chest X-ray 2 weeks earlier.

The athlete was sent to the emergency room, where the pulmonologist inserted a portable chest tube between the second and third ribs and aspirated 750 cc of air out of the chest cavity. A postinsertion X-ray was taken, which revealed 99% lung expansion. The athlete was sent home with pain medication and told to follow up with the physician the next day to determine whether to leave the chest tube in place.

At the follow-up appointment, the pulmonologist did not see a change. The athlete was admitted to the hospital and given oxygen to expand the lung. He was released 12 hr later after the lung fully expanded. A day after being released from the hospital, he went back to the emergency room complaining of left-side pain. X-rays were taken, which revealed rib fractures that had not been visible on the previous X-ray. The team physician and pulmonologist decided to delay his return to play to allow the ribs to heal. The athlete was permitted to throw during practice and participate in conditioning to tolerance, but he was not involved in any contact for a period of 2 weeks. The team physician released the athlete to participate in full contact 3 weeks postinjury with extra protective rib padding. The athlete eventually suffered a season-ending injury not related to his pneumothorax. There was some question as to whether the initial injury had resolved, and we concluded that it had contributed to the development of the more serious pneumothorax a couple of weeks later. This became a difficult case to manage because of all the contributing factors. A quick return to play after a pneumothorax should be discouraged.

Figure 1 Fifty percent pneumothorax as seen in the left lung.
Discussion

Injuries to the chest are less frequent than sprains and strains, and a pneumothorax must be promptly recognized to avert catastrophe. The low incidence of pneumothorax in athletics has hindered the development of widely accepted clinical return-to-play guidelines. Relying on clinical experience and anecdotal evidence can lead to returning athletes to play too soon, which can lead to the development of a more serious condition.

We have had the unusual experience of having two athletes with pneumothoraxes over a 2-year period, which has guided the development of our return-to-play guidelines. After each instance, we consulted with a pulmonologist. Both athletes were released to return to participation when the team physician reviewed a final x-ray to determine that the lung had fully expanded and the athlete had no symptoms such as shortness of breath or pain with activity.

Because the gradual onset of symptoms and lack of recognition of the injury caused delay in treatment in the first case, team physicians thought the athlete had suffered a traumatic pneumothorax versus a spontaneous pneumothorax. The second case was also treated as a traumatic pneumothorax, and the athlete returned too early, which led to a recurrence. After the recurrence, the athlete was treated symptomatically, and his return to contact football was delayed.

We found that a traumatic pneumothorax is rarely acute, and it can typically take 1–2 days for symptoms to develop. The athlete often thinks the symptoms are related to a rib contusion rather than trauma involving a lung. Therefore, treatment of a pneumothorax can be delayed. The recommended management for an athlete suffering from a traumatic pneumothorax includes clinical examination by a physician and serial x-ray evaluations every 3–4 days. In the event that the pneumothorax is greater than 30%, a chest tube might be recommended to accelerate healing.

Debate continues on appropriate return-to-play guidelines for a traumatic pneumothorax, but most athletes can return to contact sports after a period of 3 weeks with a fully expanded lung. Because this a rare sports-related injury, it frequently goes undetected, and poor outcomes have occurred after early return to play. Therefore, special consideration should be given to injuries to the ribs and any complications that might ensue.

References


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