Rifle shooting produces a sudden counterforce against the body thorough the anterior shoulder, which may produce a traumatic injury in soldiers. Posterior instability of the shoulder can occur in soldiers who practice rifle shooting. To the authors’ knowledge, few reports have examined shooting-related injuries in soldiers.

This article describes the case of a 27-year-old male soldier who presented with left shoulder pain and instability after rifle training. He developed symptoms, and presented radiographic findings consistent with a posterior Bankart lesion. Intraoperatively, while in the lateral decubitus position, a posterior portal was created 3 cm inferior and 2 cm lateral to the posterolateral corner of acromion for making a proper angle for inserting anchors. A reverse bony Bankart lesion and adjacent cartilage breakdown at the glenoid rim were noted. An arthroscopic capsulolabral repair was performed with 3-mm bioabsorbable anchors to the glenoid rim. No gross reverse Hill-Sachs lesion or hyaline cartilage lesion was noted. Postoperatively, the arm was supported in a sling with an abduction pillow for 5 weeks. Codman’s exercises, scapular protraction exercises, and elbow and wrist exercises were started. Physical therapy focused on reestablishing glenohumeral range of motion and rotator cuff and periscapular muscle strength. Six months postoperatively, the patient had normal scapular kinesis and reported no shoulder pain or symptoms of instability associated with a reverse bony Bankart lesion.

Drs Cho, Chung, Song, and Lee are from the Ajou University School of Medicine, Suwon, Korea. Drs Cho, Chung, Song, and Lee have no relevant financial relationships to disclose.

Correspondence should be addressed to: Doo-Hyung Lee, MD, Ajou University School of Medicine, Sun 5, Woncheon-dong, Yeongtong-gu, Suwon, 443-721, Korea (doolungee@hotmail.com).

doi: 10.3928/01477447-20121023-32

Figure: Axial T1-weighted magnetic resonance image showing posterior displacement of the humerus and a posteroinferior capsulolabral tear with a bony fragment called a reverse bony Bankart lesion (A). Axillary T1-weighted magnetic resonance image showing posterior subluxation of the left shoulder (B).
Military service is obligatory for young men in some countries, and rifle shooting is a basic activity required during military training. Many training techniques used to increase shooting accuracy have been evaluated, but few reports have examined shooting-related injuries in soldiers.1 This article describes the case a 27-year-old male soldier with recurrent posterior instability of the shoulder that developed after rifle training.

**CASE REPORT**

A 27-year-old male soldier presented with an approximately 3-year history of apprehension and pain around the left shoulder. He had sustained direct trauma to the anterior shoulder while practicing rifle shooting. Before that event, he had no major or minor shoulder trauma and no complaints with military training. He presented to the rehabilitation clinic at the military hospital and was treated with physical therapy, including periscapular and rotator cuff musculature strengthening, hot packs, ultrasonography, transcutaneous electrical nerve stimulation, and stretching spray therapy, with little effect on his symptoms. The symptoms were aggravated when shooting a rifle during military training.

On physical examination, passive shoulder joint range of motion was within the normal range, but active forward flexion and external rotation were limited to 120° and 45°, respectively. The posterior load and shift test (posteriorly directed force on the arm, with the arm positioned at 90° of forward flexion and internal rotation) was positive. No pathological translation existed of an anterior or inferior load compared with the contralateral extremity. Laboratory studies were normal. Magnetic resonance imaging revealed a posteroinferior capsulolabral complex tear with a bony fragment, called a reverse bony Bankart lesion (Figure 1), and surgical intervention was recommended.

Intraoperatively, while in the lateral decubitus position, a posterior portal was created 3 cm inferior and 2 cm lateral to the posterolateral corner of acromion to make a proper angle for inserting anchors. A reverse bony Bankart lesion (at the 6:30- to 9:00-o’clock position) and adjacent cartilage breakdown at the glenoid rim were noted. An arthroscopic capsulolabral repair was performed with 3-mm bioabsorbable anchors to the glenoid rim at the 7:00- and 8:30-o’clock positions (Figure 2). No gross reverse Hill-Sachs lesion or hyaline cartilage lesion was noted.

Postoperatively, the arm was supported in a sling with an abduction pillow for 5 weeks. Because pain was tolerable, Codman’s exercises, scapular protraction exercises, and elbow and wrist exercises were started. Physical therapy focused on reestablishing glenohumeral range of motion and rotator cuff and periscapular muscle strength. Six months postoperatively, the patient had normal scapular kinesis and reported no shoulder pain or symptoms of instability associated with a reverse bony Bankart lesion.

**DISCUSSION**

In military training, rifle shooting produces a sudden counterforce against the body through the anterior shoulder. This rarely results in traumatic injury to soldiers.2 The impact against the body when shooting in the standing position exceeds 3500 N. The force from the rifle is first transferred to the shoulder joint.
and then to other joints, such as the wrist, back, and hip.\textsuperscript{3} Long thoracic nerve traction injuries have been reported secondary to prolonged positioning of the arm while shooting a rifle.\textsuperscript{3} The transmission of impulsive and vibratory energy from the shoulder to the cervical spine and the subsequent minimal whiplash injury may be responsible for paroxysmal positional vertigo.\textsuperscript{5}

To the authors’ knowledge, this is the first report of traumatic shoulder instability resulting from rifle shooting. The current patient reported severe pain and posterior instability during rifle training after the initial trauma. Posterior shoulder instability accounts for less than 2\% of all shoulder dislocations and is usually caused by an epileptic fit, an electrical shock, or athletic trauma (such as a fall onto an outstretched arm).\textsuperscript{6} Posterior shoulder instability is difficult to diagnose because it is rare and its primary symptom is pain, not apprehension. The posterior load and shift test is a good tool for diagnosing posterior shoulder instability. The current patient reported symptoms with his arm in a provocative position, which usually included forward flexion, adduction, and internal rotation; this position is similar to the standing posture assumed when shooting a rifle.\textsuperscript{7} Therefore, shooting with an improper posture could push the shoulder backward, increasing the risk of injury, such as traumatic posterior shoulder instability.

\begin{thebibliography}{9}
\bibitem{5} Bruno E, Napolitano B, Girolamo SD, Padova AD, Alessandrini M. Paroxysmal positional vertigo in skeet shooters and hunters. Eur Arch Otorhinolaryngol. 2007; 264(4):381-383.
\end{thebibliography}