

SUCCESSFUL CASE OF REMOVAL OF A WIRE THAT MIGRATED INTO THE PLEURAL SPACE AFTER CLAVICLE OSTEOSYNTHESIS.*Abidov Utkir Oktamovich**Bukhara State medical institute**Bukharian Branch of the Republican Research Center of Emergency Medicine*

A unique case is described where a Kirschner wire, used for the osteosynthesis of a fracture at the proximal end of the left clavicle and stabilization of the sternoclavicular joint, migrated over five years from the surgical site. The wire moved through the posterior mediastinum, passing between the esophagus and the superior vena cava, and entered the right pleural cavity. The patient was successfully treated with a video-assisted thoracoscopic surgery.

Keywords: *migration of the Kirschner wire, sternoclavicular joint, pleural cavity.*

The migration of components in metal constructs is a serious complication in osteosynthesis, becoming particularly dangerous when these elements shift to neighboring anatomical areas. Cases where Kirschner wires and other stabilizing implants break and migrate locally are not uncommon, even if they were initially installed correctly. Clavicle fractures account for 2% to 17% of all fractures and are most often seen in middle-aged men. Currently, most of these fractures are treated surgically, using metal constructs like Kirschner wires for fixation.

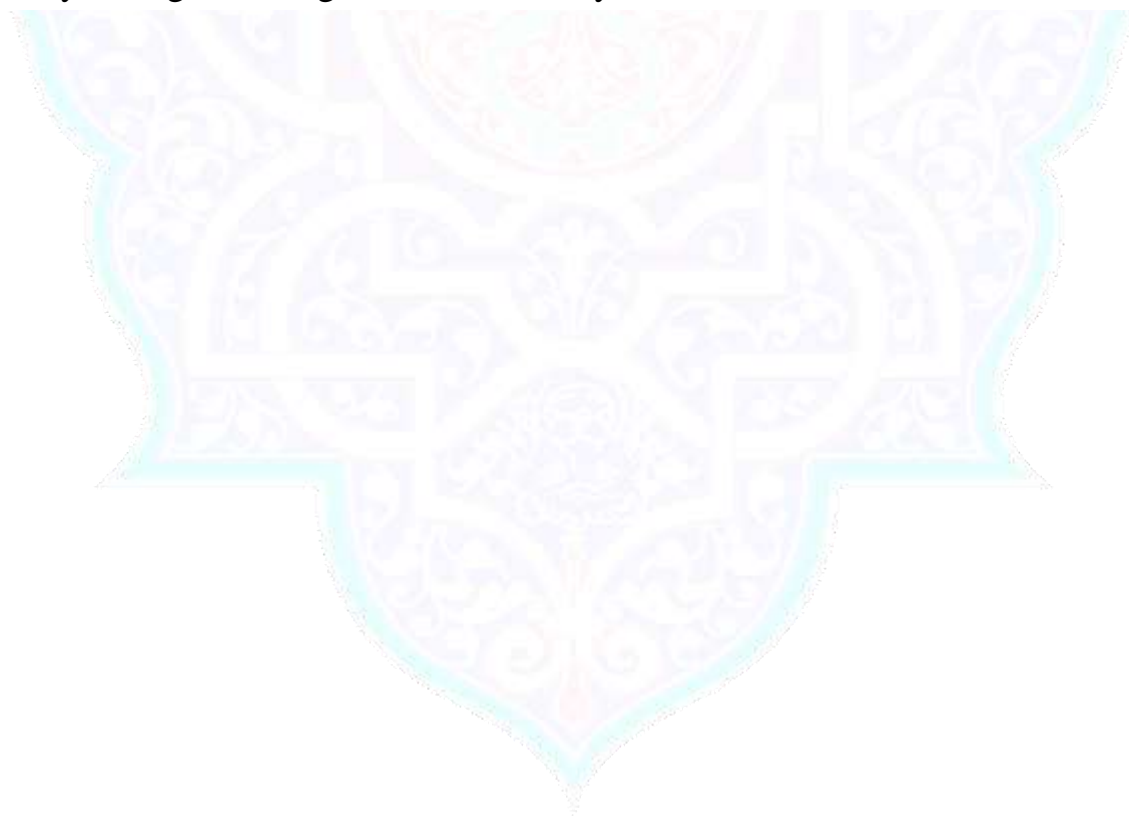
Numerous cases of complications associated with clavicle osteosynthesis and sternoclavicular joint are described in the medical literature. For example, A.A. Bushev and colleagues report the migration of a screw to the pericardium three months after osteosynthesis of the left sternoclavicular joint. T.Y. Todorov and R.P. Petrunov described a case where a Kirschner wire migrated to the bifurcation of the right popliteal vein. P. Naidoo observed a Kirschner wire migrating into the abdominal aorta.

The process of component migration in constructs used for stabilizing acromioclavicular joint injuries is not fully understood. Key factors contributing to the migration of such metal constructs include intense movements in the shoulder joint, accompanied by muscle contraction and relaxation of the shoulder girdle, negative pressure in the thoracic cavity related to respiratory movements, the influence of gravity, and even the capillary effect.

The migration of stabilizing elements into the spinal canal is associated with a high risk of serious neurological disorders and can lead to damage to the spinal cord, major neck vessels, and pleura during their surgical removal [4].

The purpose of the message: To highlight the potential risks of damage and migration of metal implants used in traumatology to the attention of medical specialists in surgery. A case of successful migration of a wire from the proximal end of the left clavicle through the posterior mediastinum into the right pleural cavity is documented, without damaging important anatomical structures. Five years after an unsuccessful attempt to remove a Kirschner wire associated with a fracture of the proximal end of the left clavicle, a foreign object – a wire fragment in the right pleural cavity – was discovered.

Case description: Patient X.F., 39 years old, medical record no. 23534/3121, was admitted on May 12, 2023, to the emergency surgery department of the Bukharian branch of the Republican Research Center of Emergency Medicine with complaints of constant, dull chest pains behind the sternum and in the right half of the thoracic cage. From the medical history: the patient was hospitalized on March 27, 2023, in the traumatology department of the Ramitan sub-branch of the Republican Research Center of Emergency Medicine with a diagnosis of a traffic accident, closed fracture of the proximal end of the left clavicle. The patient underwent surgery: osteosynthesis of the fracture of the proximal end of the left clavicle and fixation of the sternoclavicular joint with two Kirschner wires. A year later, during a surgery to remove the Kirschner wire due to the fracture of one wire, its fragment was left behind. Subsequently, the patient occasionally experienced pains in the sternum area, especially during breathing, which in recent years have become constant.



The patient's condition upon admission was satisfactory. The skin and mucous membranes were of normal color, lymph nodes were not enlarged. The thoracic cage was without deformations, participated in the act of breathing, and was symmetrical.



fig. 1. Chest X-ray of the patient. Foreign body in the right pleural cavity.



Fig. 2. Intraoperative view: Pleural cavity

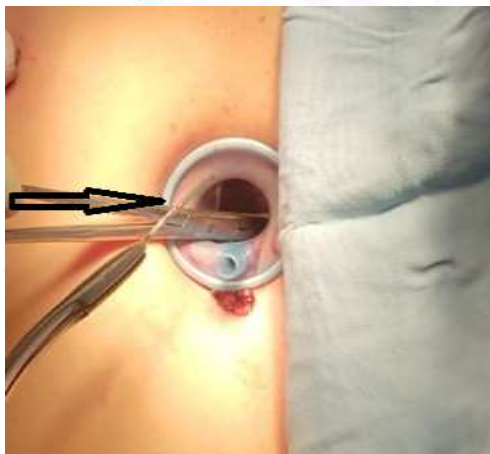


Fig. 3. Moment of video-assisted thoracoscopic removal of the foreign body.



Fig. 4. The removed foreign body.

Vesicular breathing was present on both sides of the lungs. Heart tones were muffled. Blood pressure was 110/70 mm Hg, pulse 70 beats per minute. The abdomen was symmetrical, soft, and painless.

The patient was examined: Complete blood count: Hemoglobin – 110.0 g/L, Erythrocytes - $3.9 \times 10^{12}/L$, MCV - 0.9, Leukocytes - $10.0 \times 10^9/L$, ESR - 310-337. Erythrocyte sedimentation rate (ESR) - 11 mm/hr. Biochemical blood analysis: Total protein – 67.0 g/L, Total bilirubin – 17.2 $\mu\text{mol}/L$, ALT – 0.25 $\mu\text{mol}/L$, AST – 0.25 $\mu\text{mol}/L$. Coagulogram: Fibrinogen - 390, Thrombotest - Grade V. Recalcification time – 78 seconds.

On the chest X-ray: An foreign object measuring 4-5 cm in length was identified in the projection of the upper lobe of the right lung (Fig. 1). Following the radiological examination of the thoracic cavity, migration of the remaining part of one wire was detected. To determine the localization of the wire, select the surgical approach, and decide on the type of operation, a computed tomography was performed for the patient.

It was established that the wire, measuring 4 – 5 cm, migrated through the posterior mediastinum into the right pleural cavity, with 2/3 of the wire located in the mediastinum and 1/3 embedded in the lung tissue.

The patient was diagnosed with: Foreign body in the right pleural cavity. The condition followed the osteosynthesis operation (2013) and the removal of the wire from the left clavicle (2014).

On January 17, 2018, the patient underwent a surgery: video-assisted thoracoscopic removal of the migrated part of the Kirschner wire (Figs. 2, 3). The wire, 5 cm in length, was located with one-third in the mediastinum under the mediastinal pleura, and one-third superficially embedded in the right lung tissue under the visceral pleura. The migrated part of the Kirschner wire was positioned in an oblique direction and had traveled from top to bottom, front to back, through the posterior mediastinum into the right pleural cavity, between the esophagus and the superior vena cava (0.5 cm above the superior vena cava). In the right part of the mediastinum, the mediastinal pleura was incised, the distal end of the wire was mobilized, and then removed using clamps. The operation was completed with the drainage of the pleural cavity according to Byulau.

Macroscopic specimen: a 7 cm piece of the Kirschner wire (Fig. 2).

Treatment measures included the use of painkillers and antibiotic therapy. The recovery period after the surgery proceeded without any complications. All of the patient's complaints that arose after the surgical intervention were resolved. A follow-up chest radiography conducted the next day revealed no signs of pneumothorax; the lung was functioning normally, and the sinuses were clear. The drainage was removed on the second day after the surgery. On the fourth day, the patient was discharged in good condition.

The analysis of the clinical case allows us to draw the following conclusions and offer some recommendations:

1. Surgeons in the outpatient-polyclinic network are not sufficiently familiar with possible integrity issues of metal constructs, their migration, and potential complications. This could explain the delayed diagnosis and untimely removal of the migrated wire.
2. Immobilization with a plaster cast is necessary for four weeks post-operation. Patients should be informed that during the rehabilitation period, they should avoid movements with an amplitude of over 90 degrees and lifting heavy weights, and the metal construct should be removed within two months after the surgical intervention.
3. Surgical interventions require a thorough knowledge of the topographical anatomy in the area of the migrated object. The key to their successful execution is the choice of the optimal type of operation and a less traumatic approach.

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