

# Laparoscopic Repair of a Traumatic Right Diaphragmatic Injury: A Case Report

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## Introduction

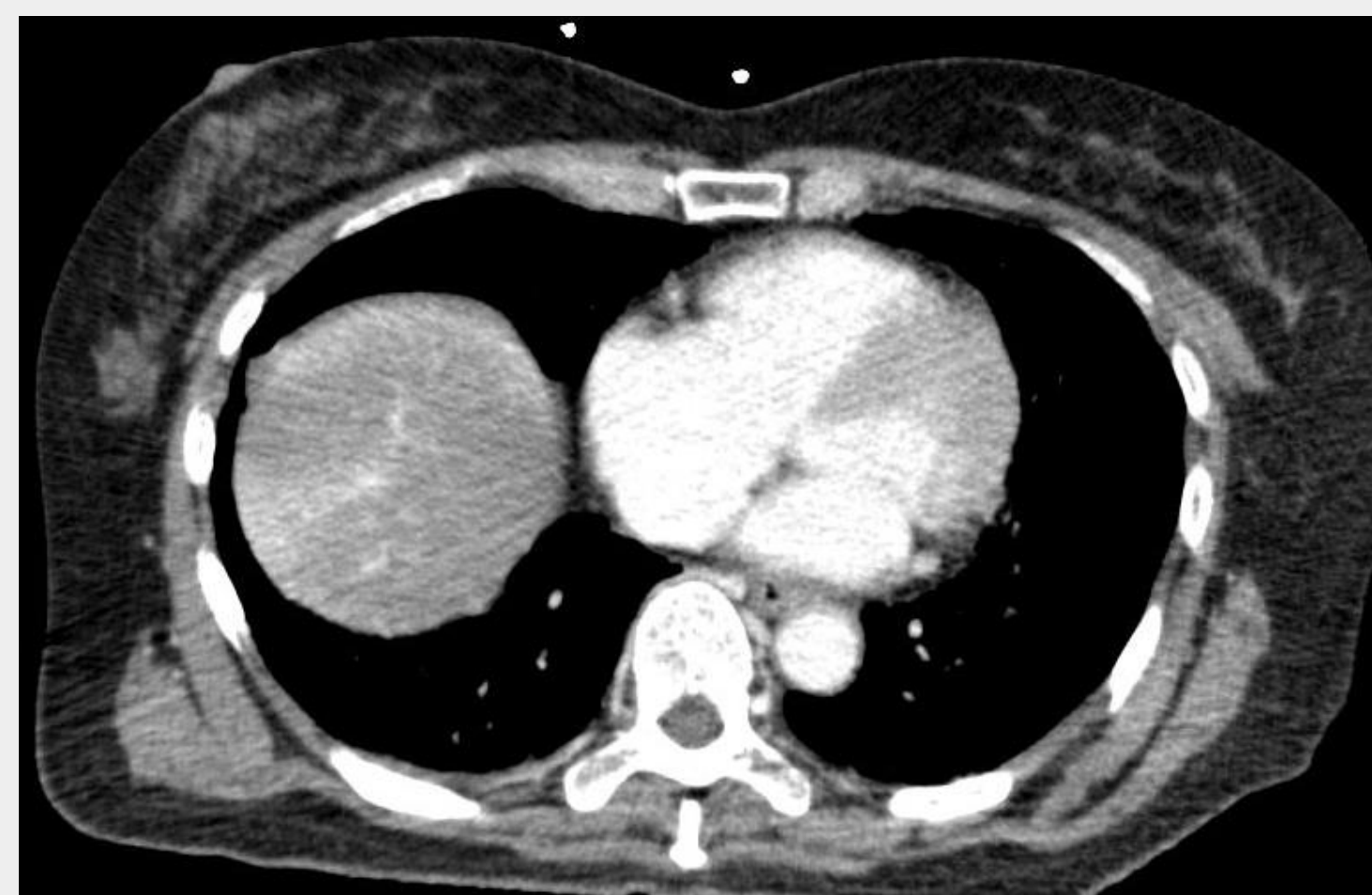
Traumatic diaphragmatic injuries are uncommon, and right-sided ruptures are particularly rare due to the protective effect of the liver. Although laparoscopic repair has been increasingly reported for left-sided injuries, it has not yet been established as a standard approach, and its application in right-sided injuries remains rare.

## Case presentation

A 55-year-old woman sustained multiple injuries, including pelvic fractures, retroperitoneal hematoma, liver injury, right tibiofibular fractures, and right diaphragmatic rupture, following a head-on motor vehicle collision.

She presented in hemorrhagic shock and was admitted to the intensive care unit for resuscitation and stabilization. Surgical repair of the diaphragmatic injury was initially deferred until her condition improved.

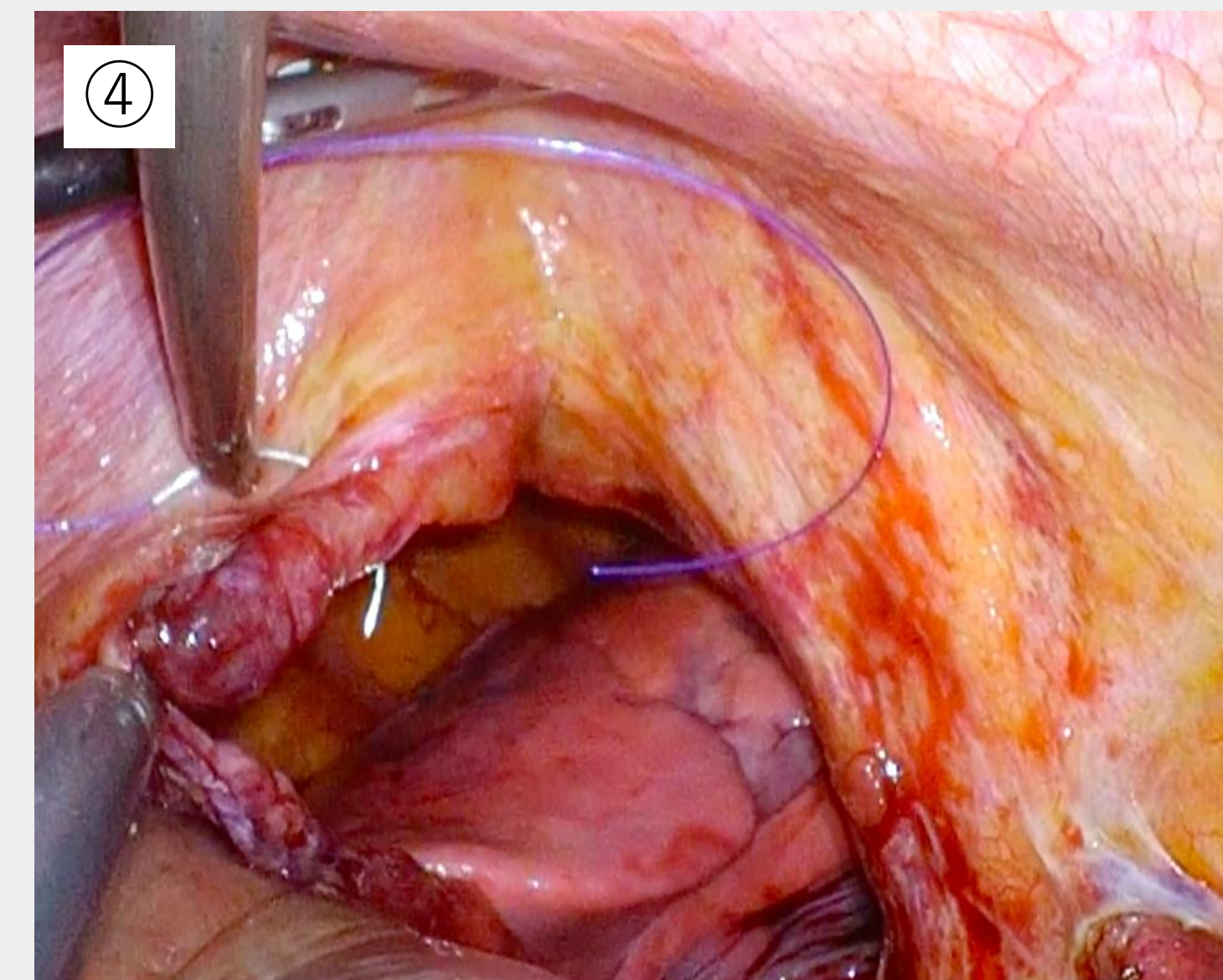
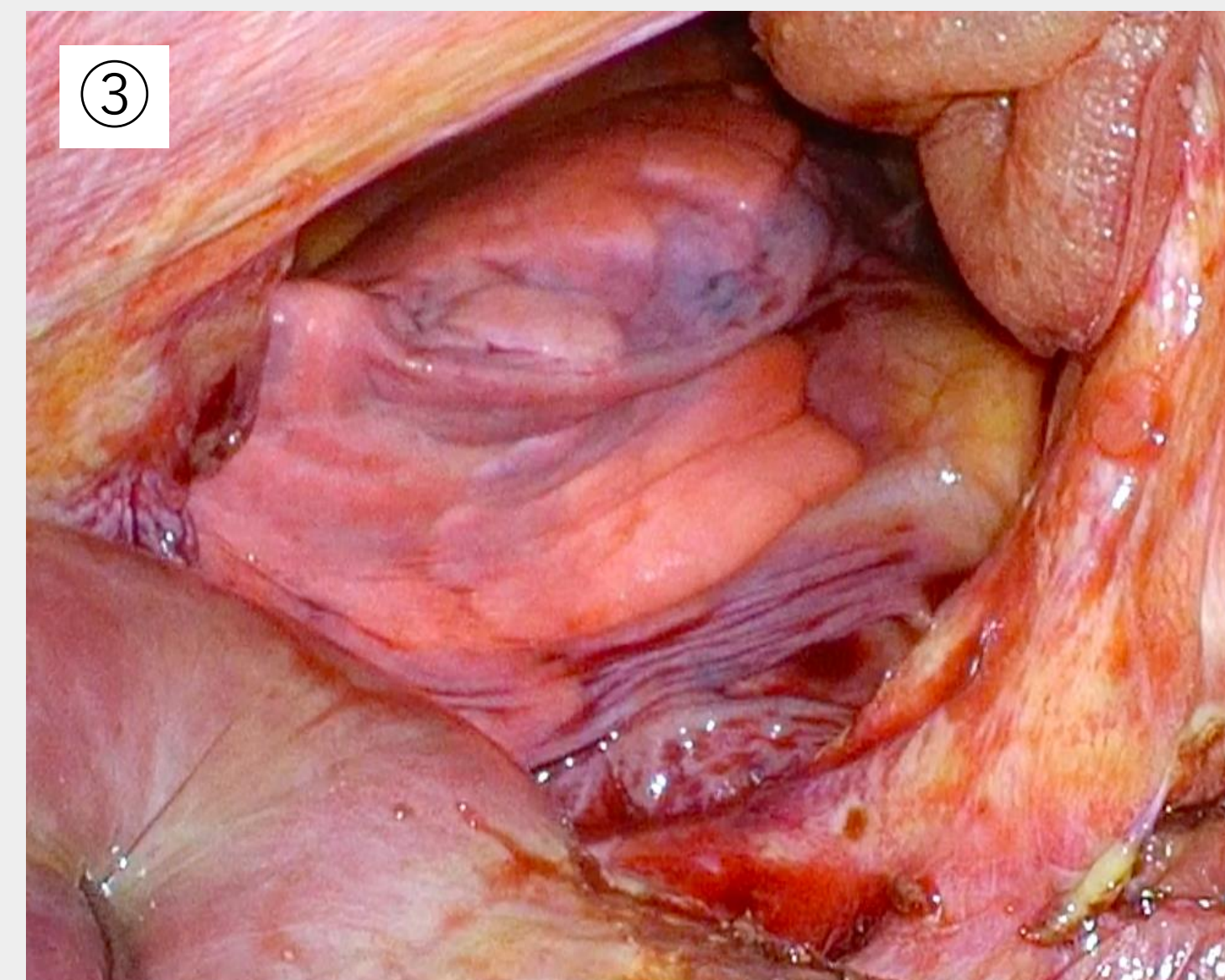
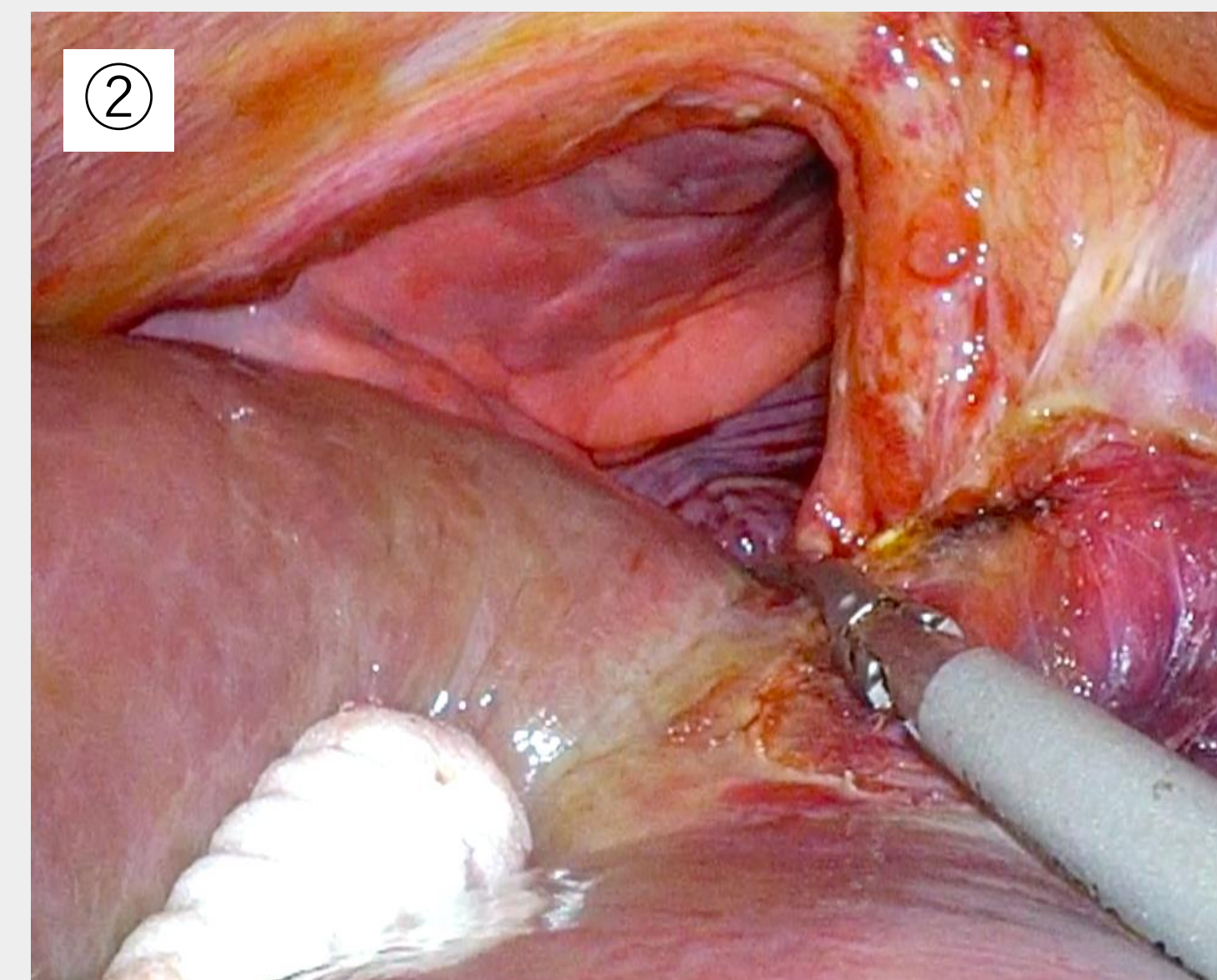
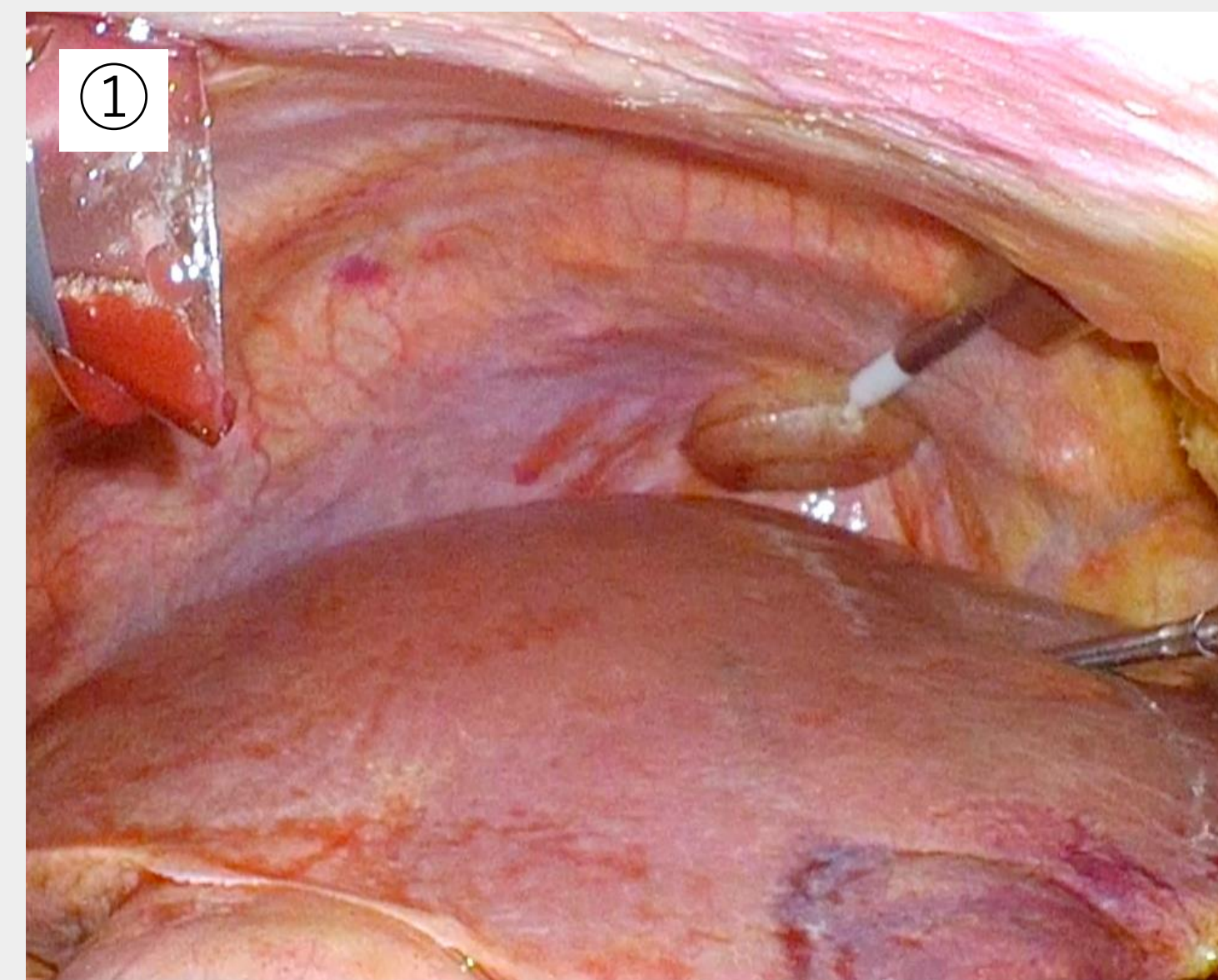
On post-injury day 7, she developed worsening hypoxemia, elevated liver enzymes, and hyperbilirubinemia. Imaging demonstrated herniation of the right hepatic lobe into the thoracic cavity, suggesting hepatic congestion. Surgical repair was therefore planned.



elevation of the liver into the right hemithorax and hump sign (yellow arrow).

## Operative Findings and Procedure

Laparoscopic surgery was performed on post-injury day 8 using five ports. Intraoperatively, an approximately 8-cm defect was identified in the right diaphragm, with the congested right hepatic lobe herniated into the thoracic cavity. The liver was carefully reduced into the abdominal cavity. The diaphragmatic defect was then closed laparoscopically using nonabsorbable sutures.



① Initial laparoscopic view  
③ Right diaphragmatic defect (8 cm)

② Right coronary ligament division  
④ Nonabsorbable suture repair



⑤ Completed closure

## Results

operative time : 185 minutes  
blood loss : minimal  
postoperative course :  
transferred to the orthopedic department on POD 17

## Discussion

In this case, progressive respiratory failure and worsening liver dysfunction prompted surgical intervention.

Laparoscopic repair offers advantages such as excellent visualization and reduced surgical invasiveness, although its application in right-sided injuries remains limited due to technical challenges including limited working space.

In our patient, laparoscopic access provided excellent visualization, enabling safe reduction of the herniated liver and secure closure of the diaphragmatic defect.

This case demonstrates that laparoscopic repair can be successfully performed even for right-sided diaphragmatic rupture.

## Conclusion

Laparoscopic repair may be a safe and effective treatment option for selected patients with right-sided traumatic diaphragmatic rupture with hepatic herniation.