
PRE
Mar 2014
COMMENTED by Martin Jaeger
ICUC
0w
Aftercare 14 weeks


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PRE
This is a varus displaced 2-part fracture with medial comminution.
This is a classic indication for a nail.


PRE
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The challenge here is to get the humeral head off the varus.
This is a varus displaced 2-part fracture and you can discuss
whether to use a nail or a plate could be used. They have decided to use a plate.


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The patient is placed in the supine position and not in the beach chair position.
The supine position has excellent beneficial effects
for intra-operative X-ray control.


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Deltopectoral approach.


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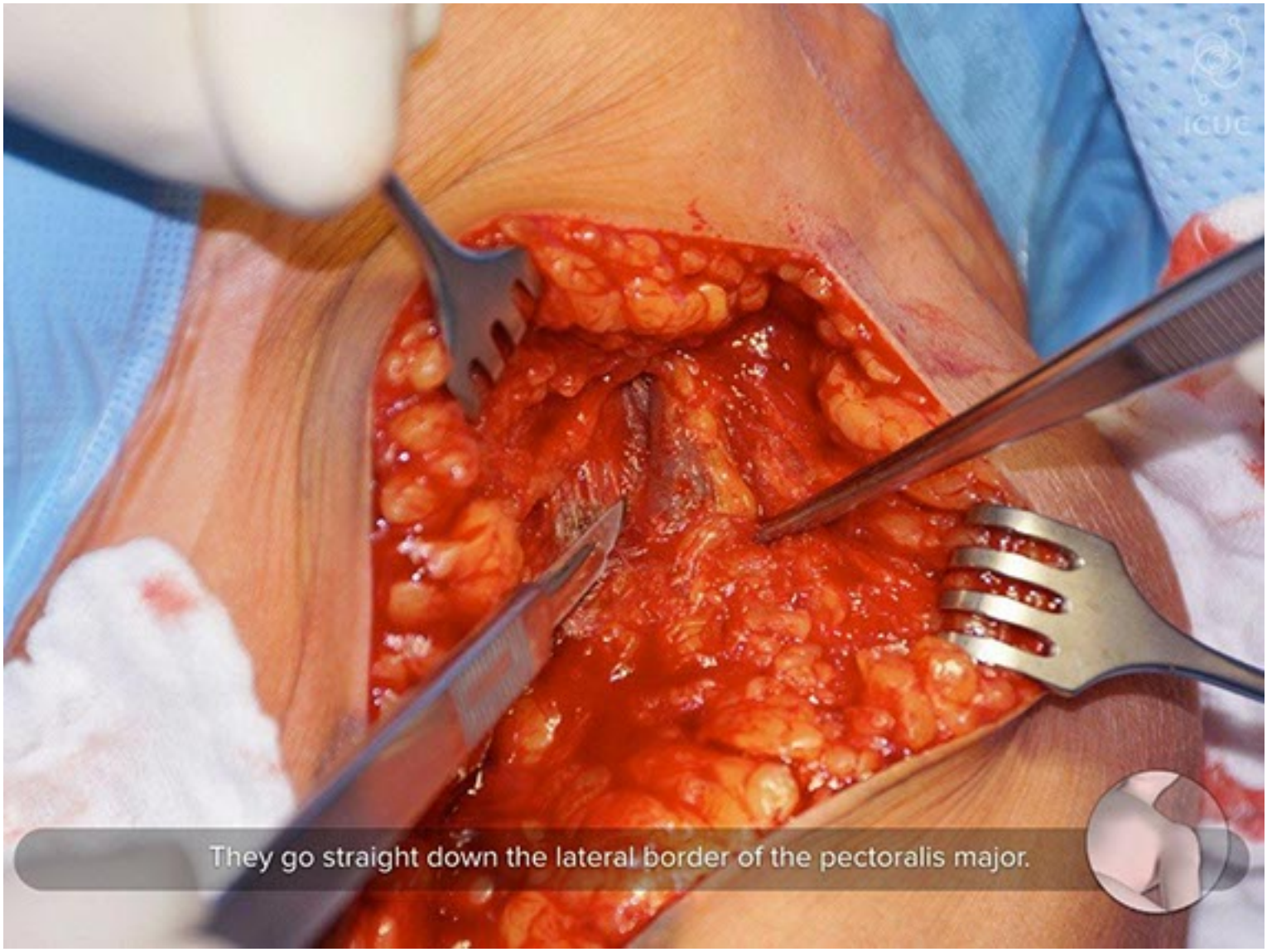
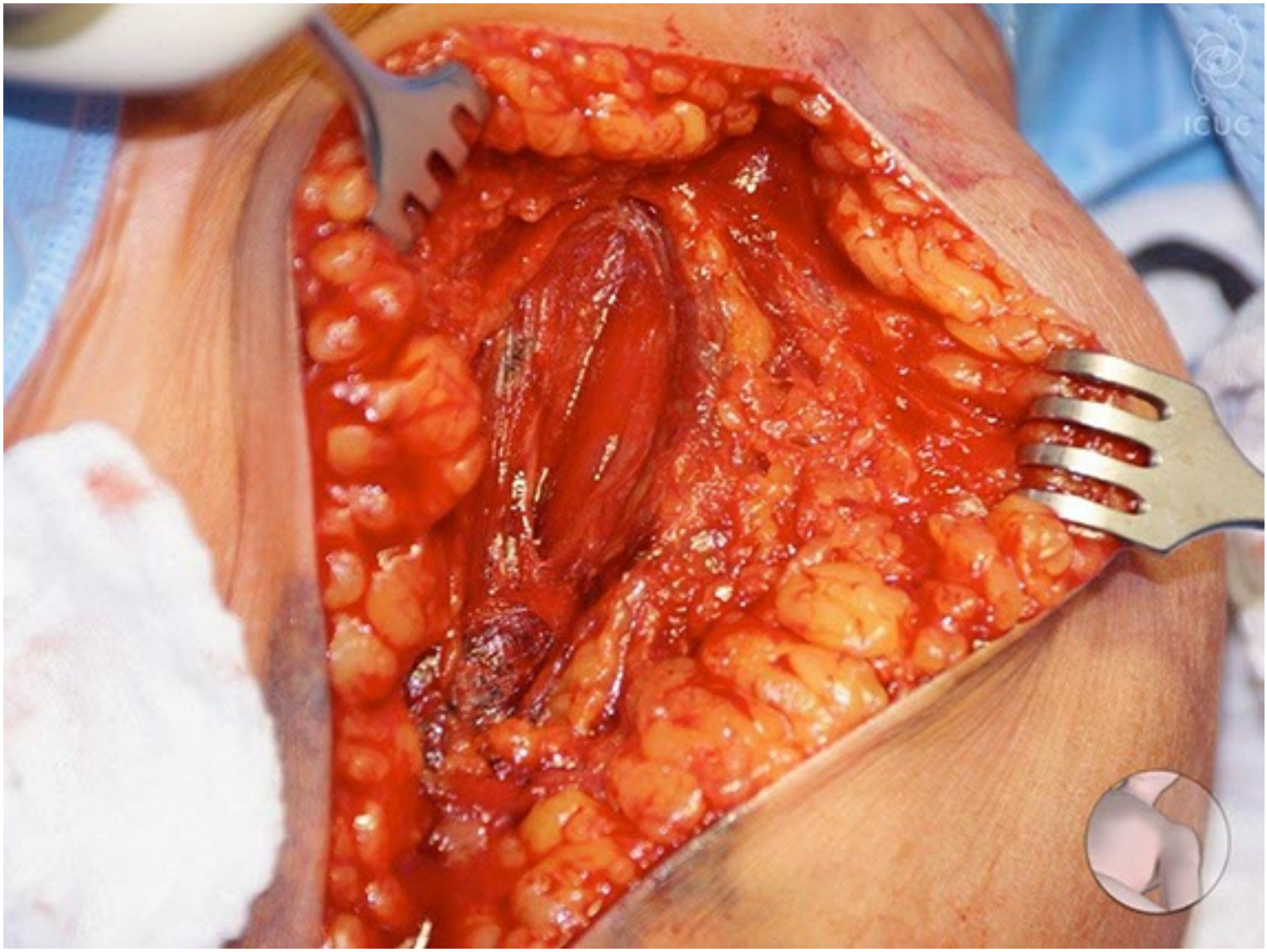
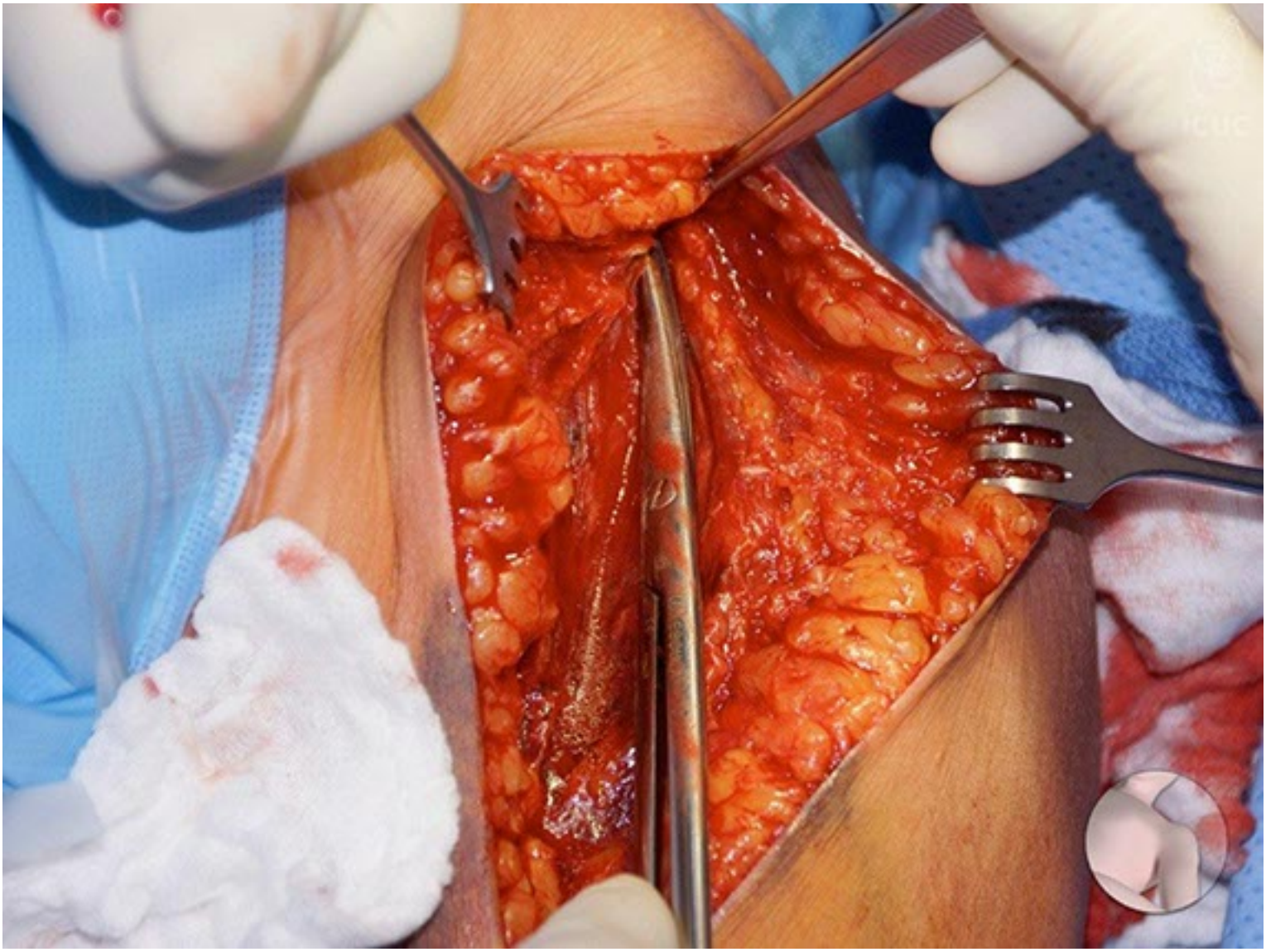
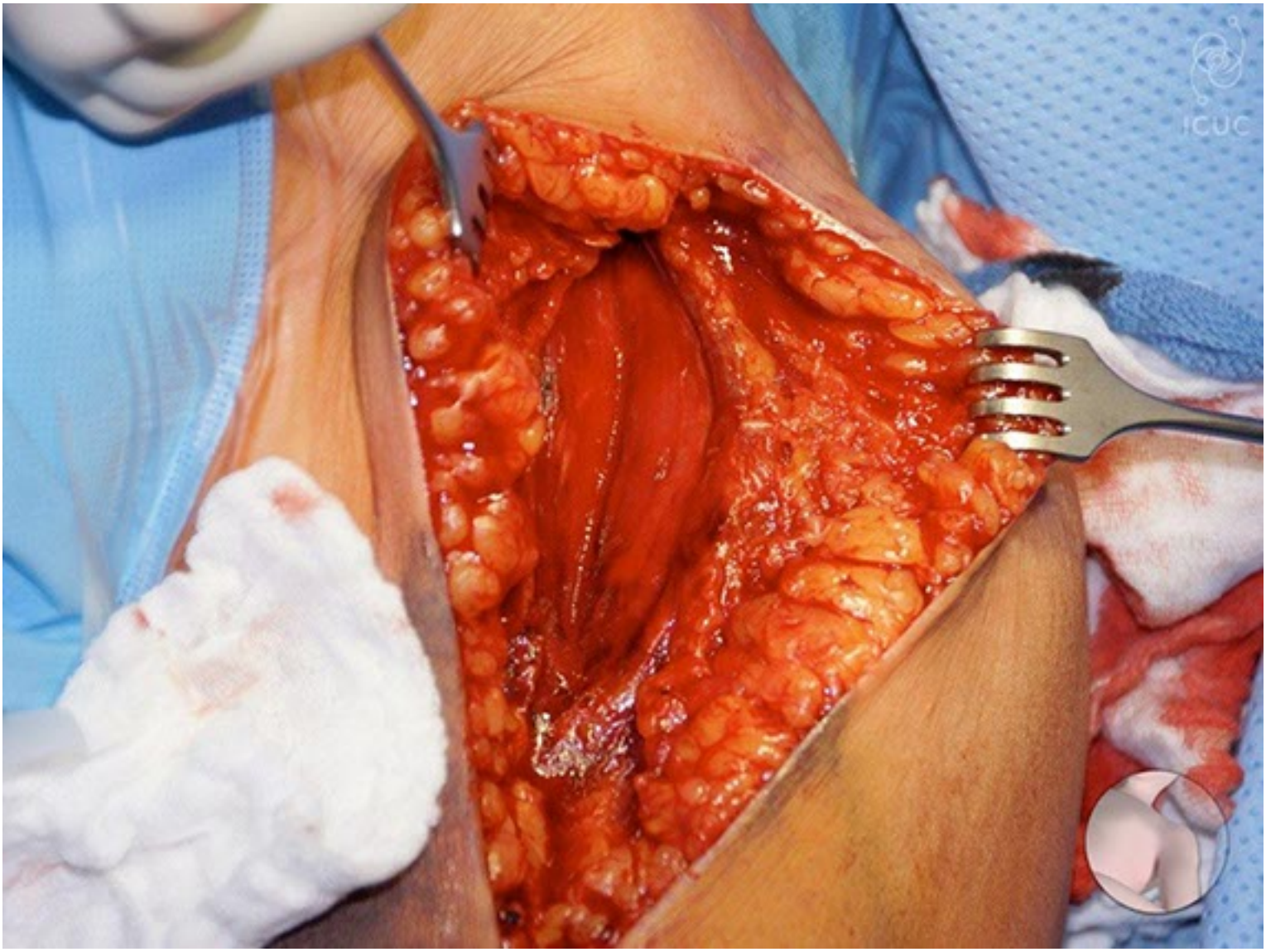
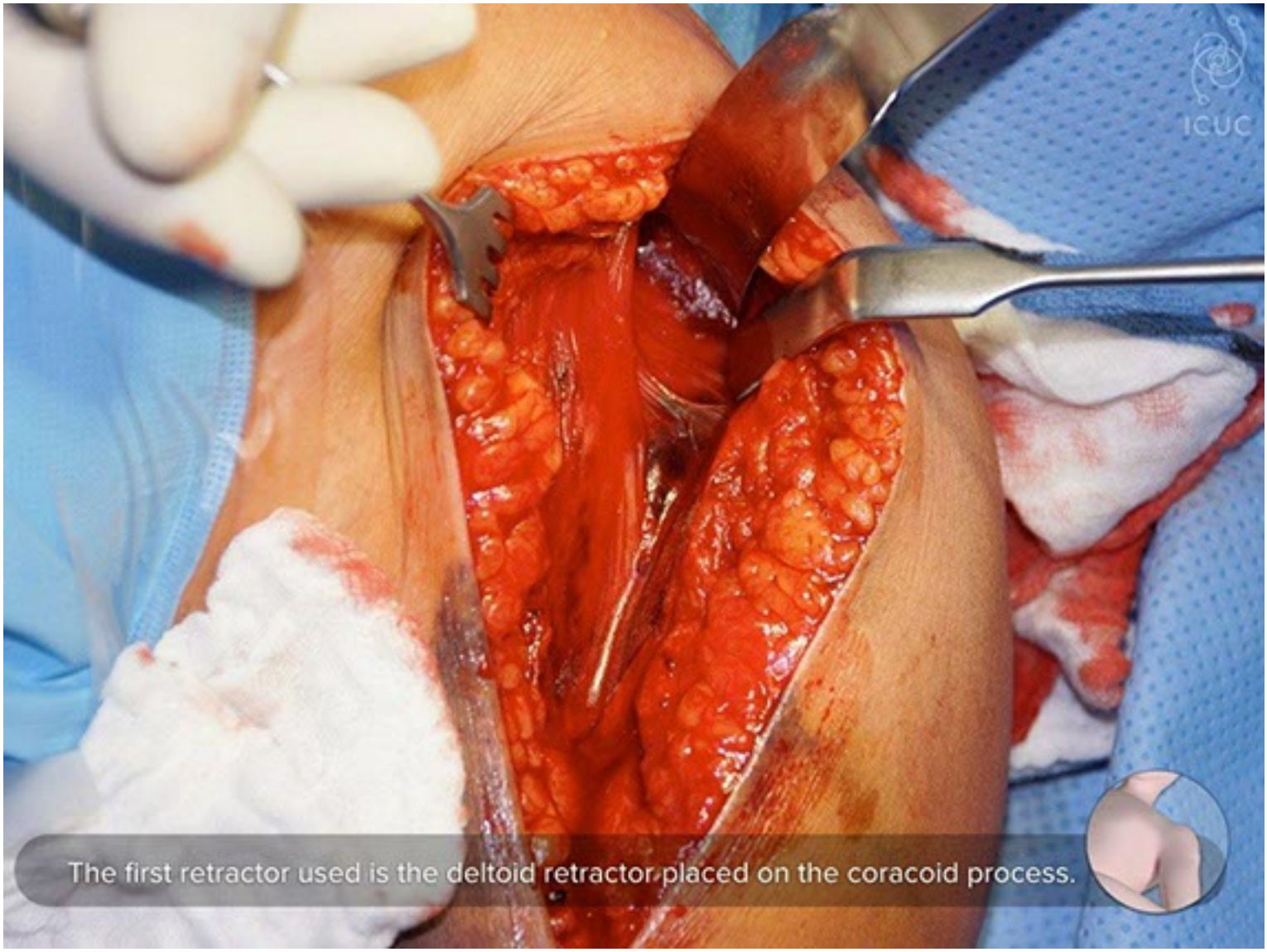

They go straight down the lateral border of the pectoralis major.





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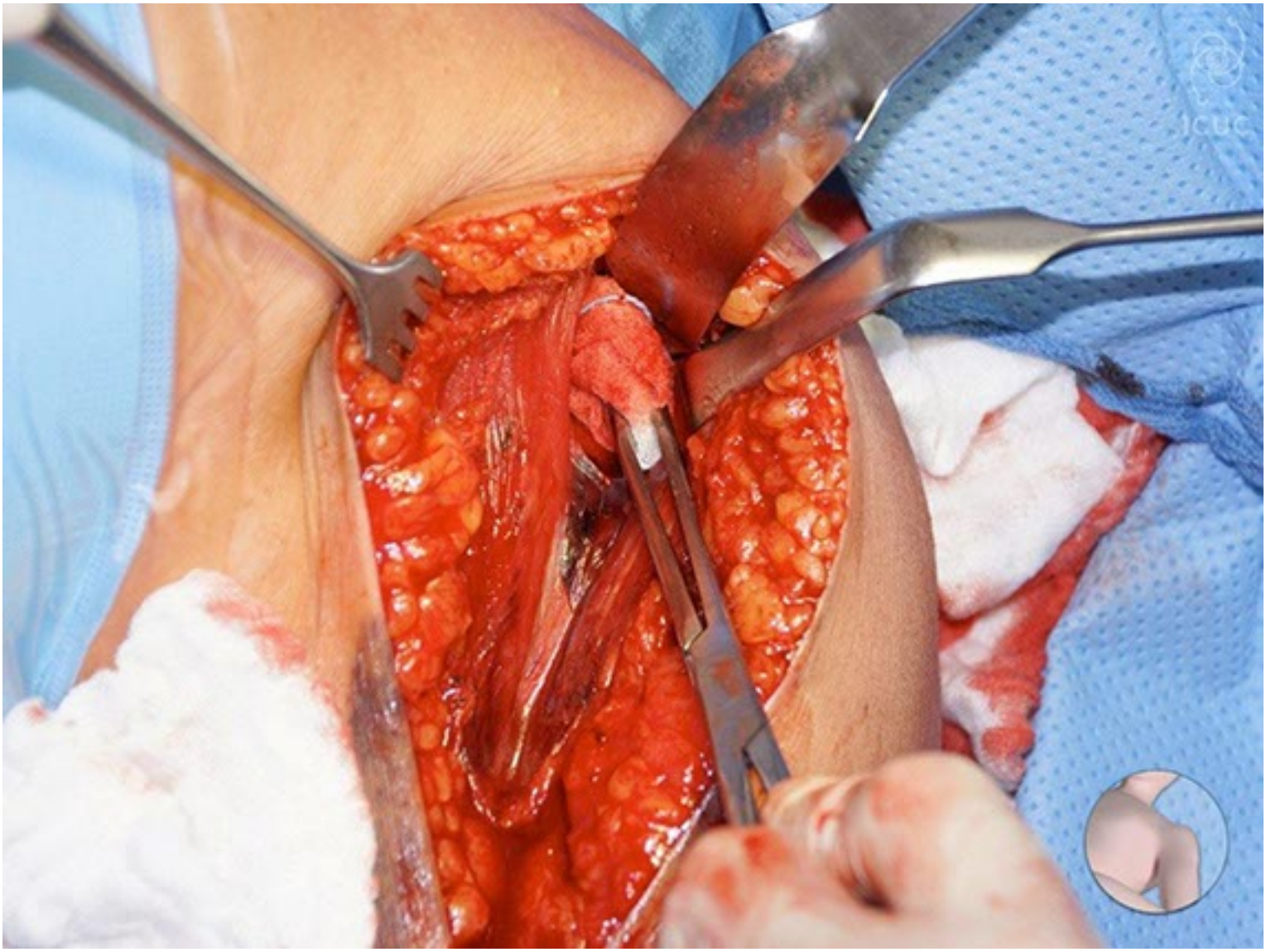
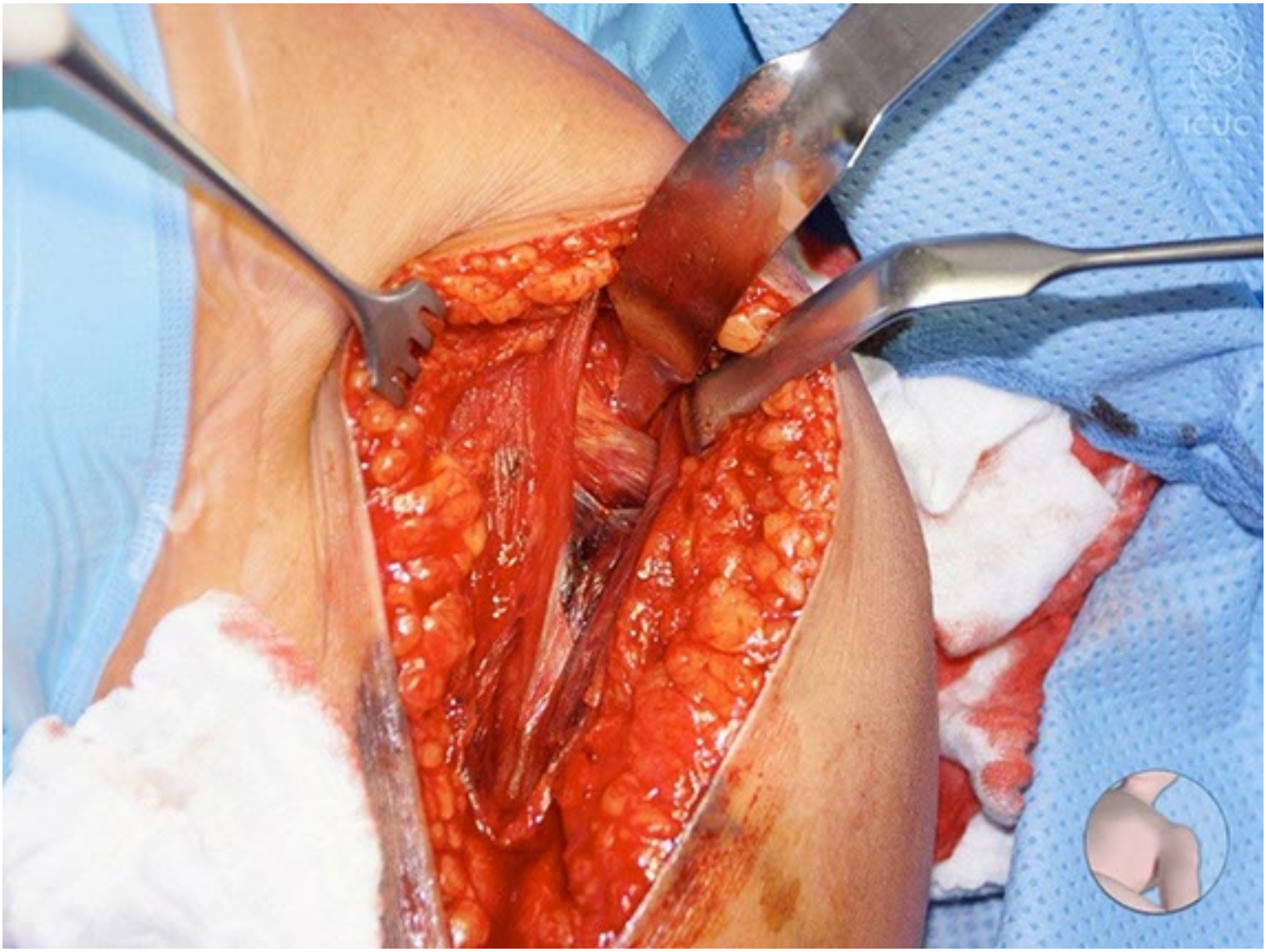
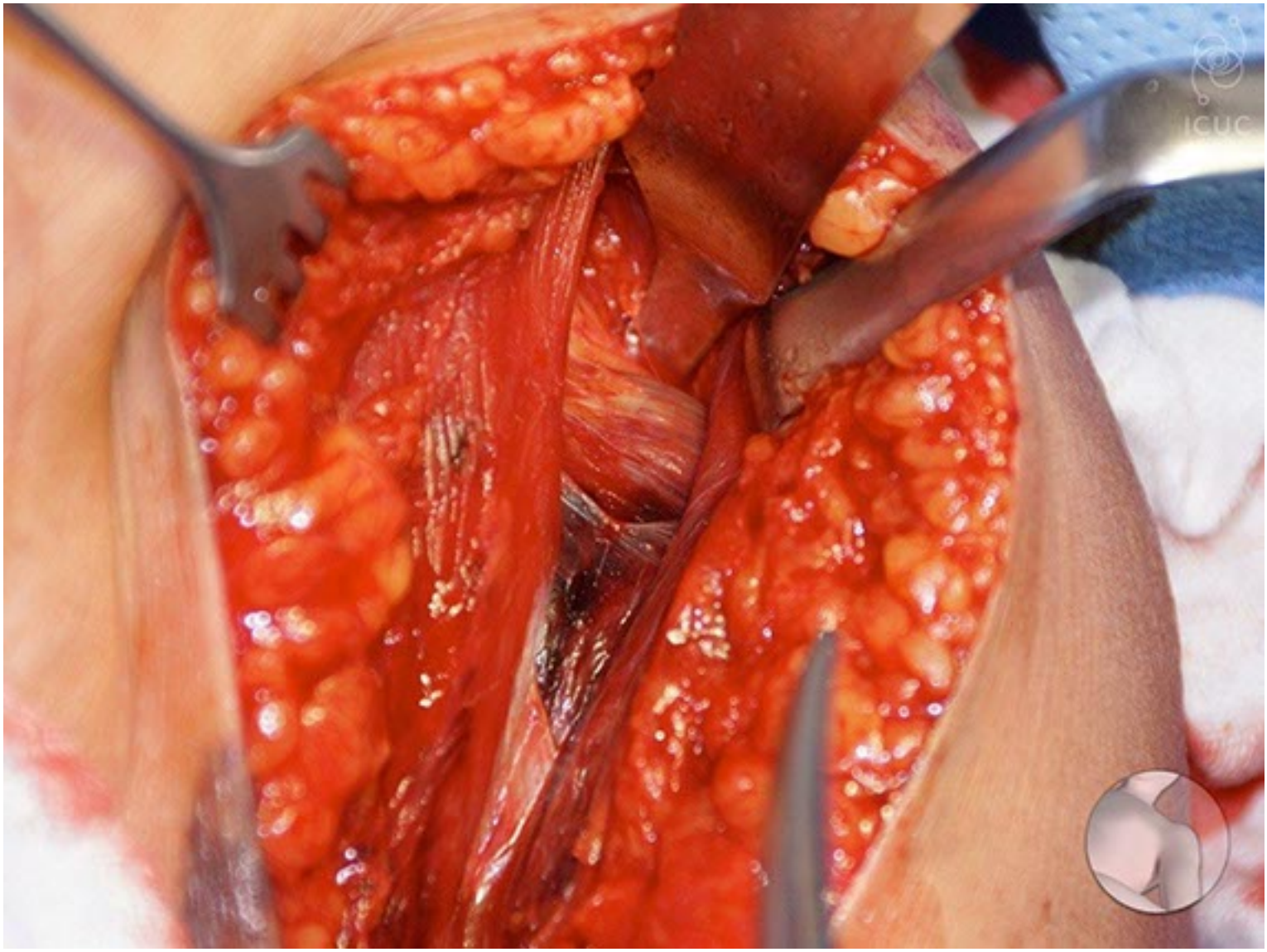
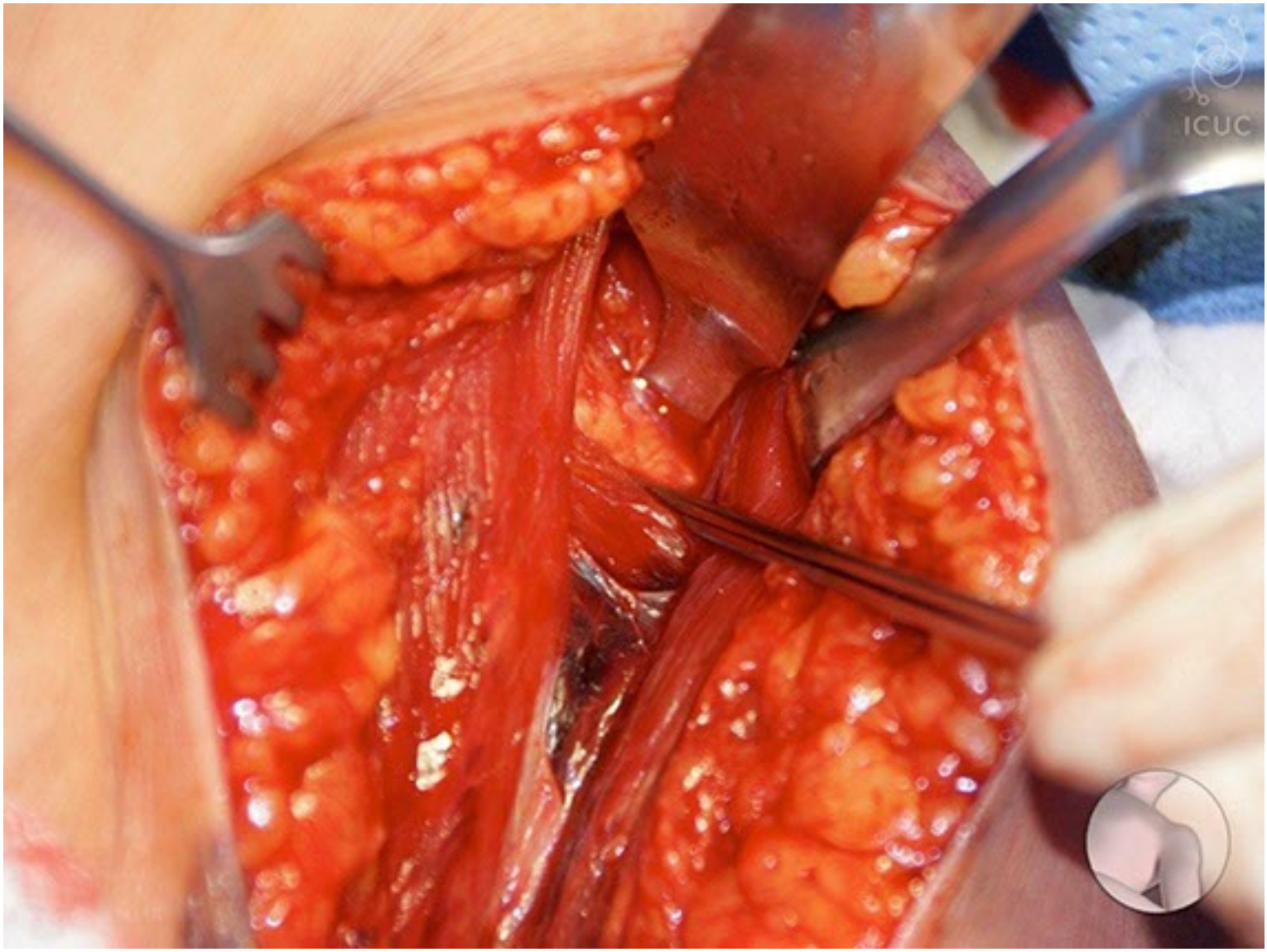
The first retractor used is the deltoid retractor placed on the coracoid process.





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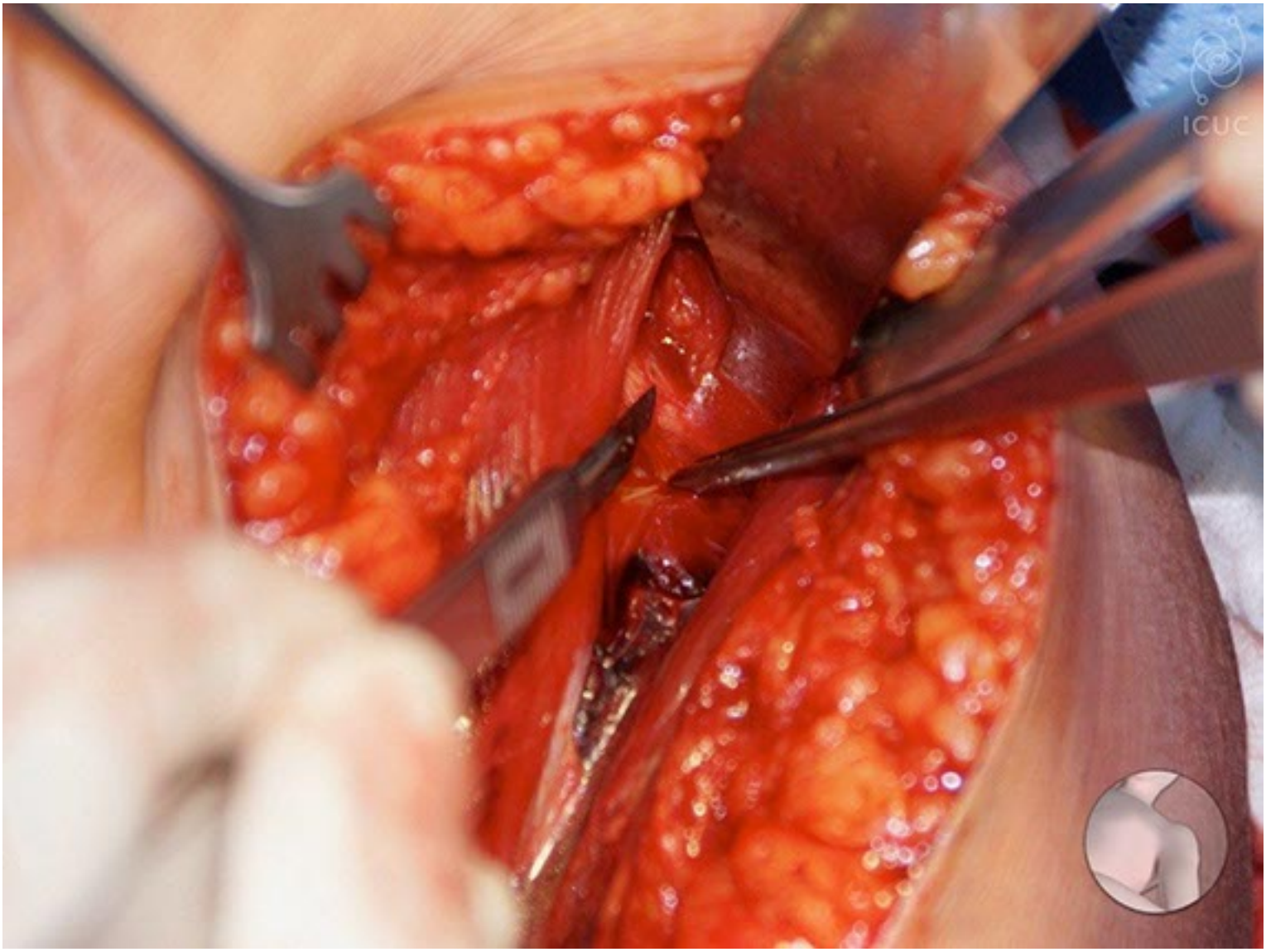

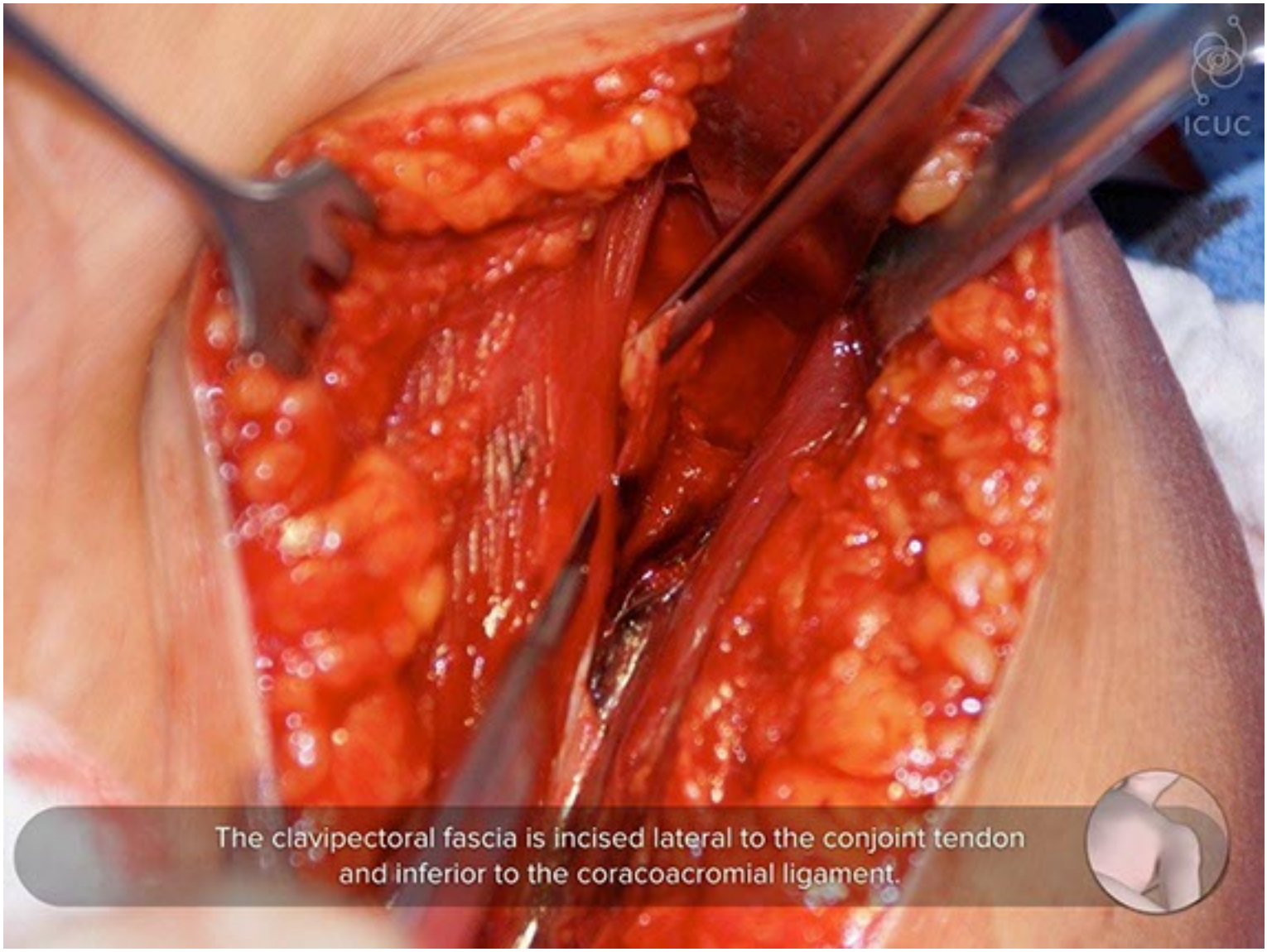
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The clavipectoral fascia is incised lateral to the conjoint tendon
and inferior to the coracoacromial ligament.


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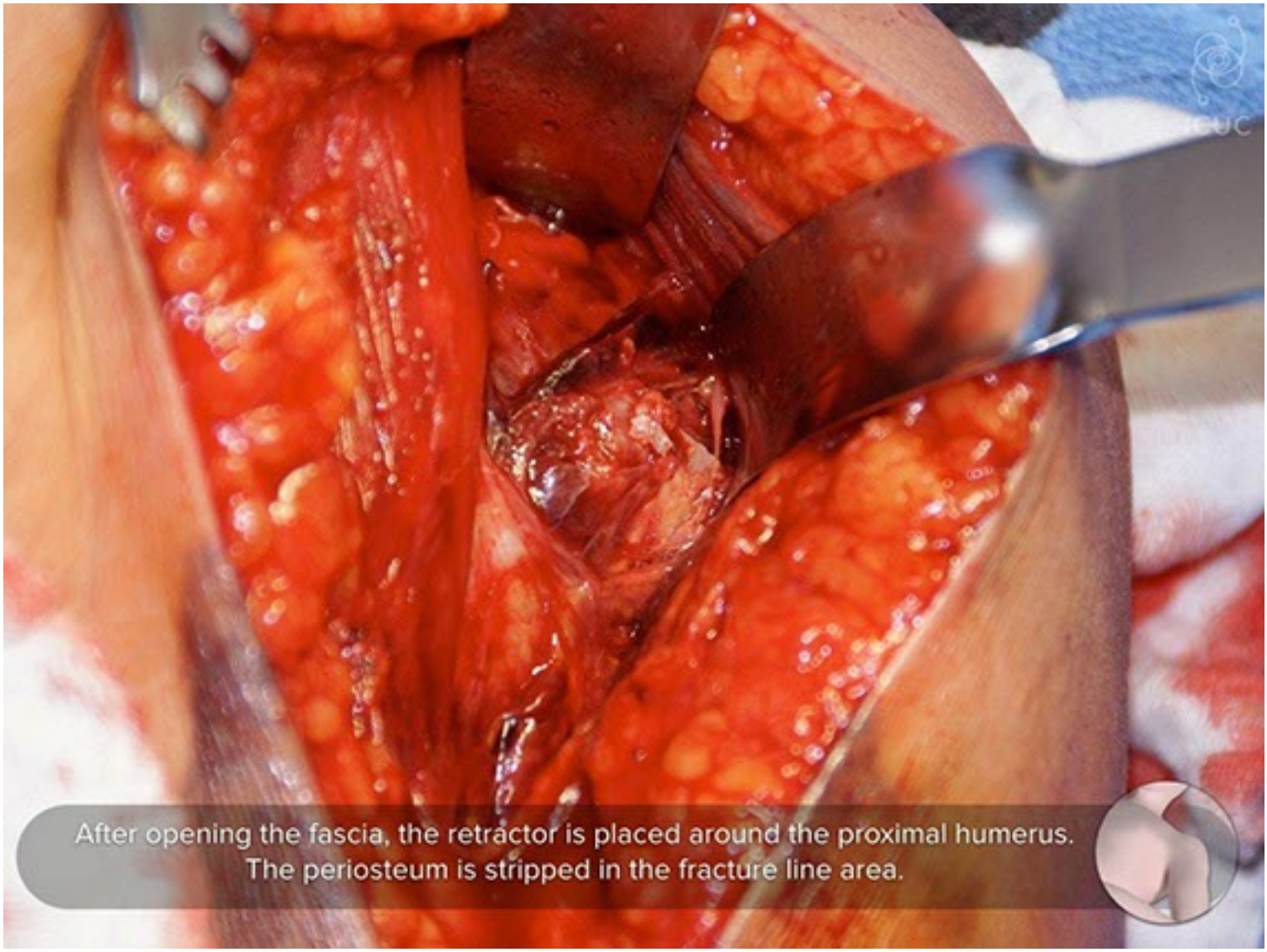
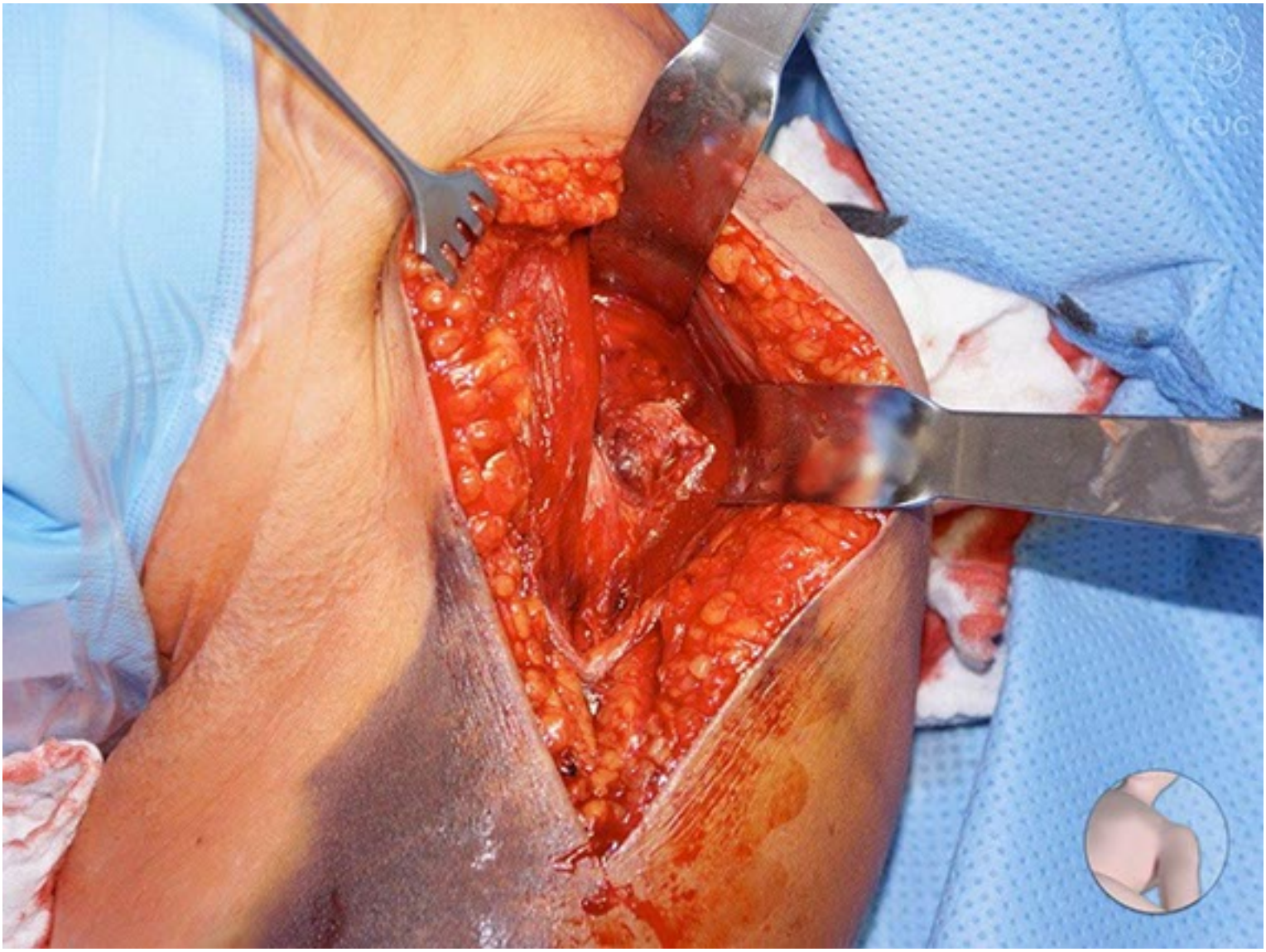
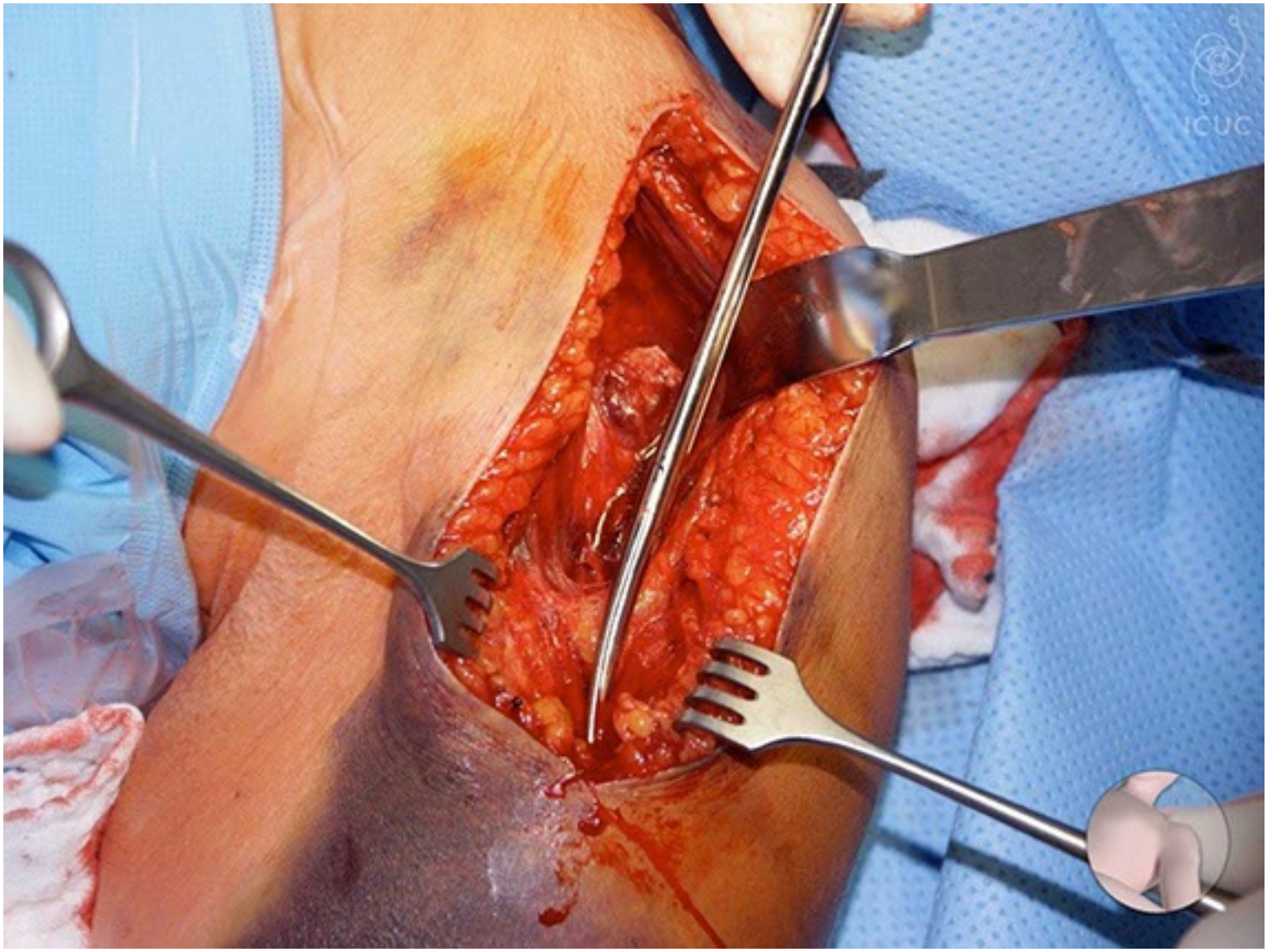
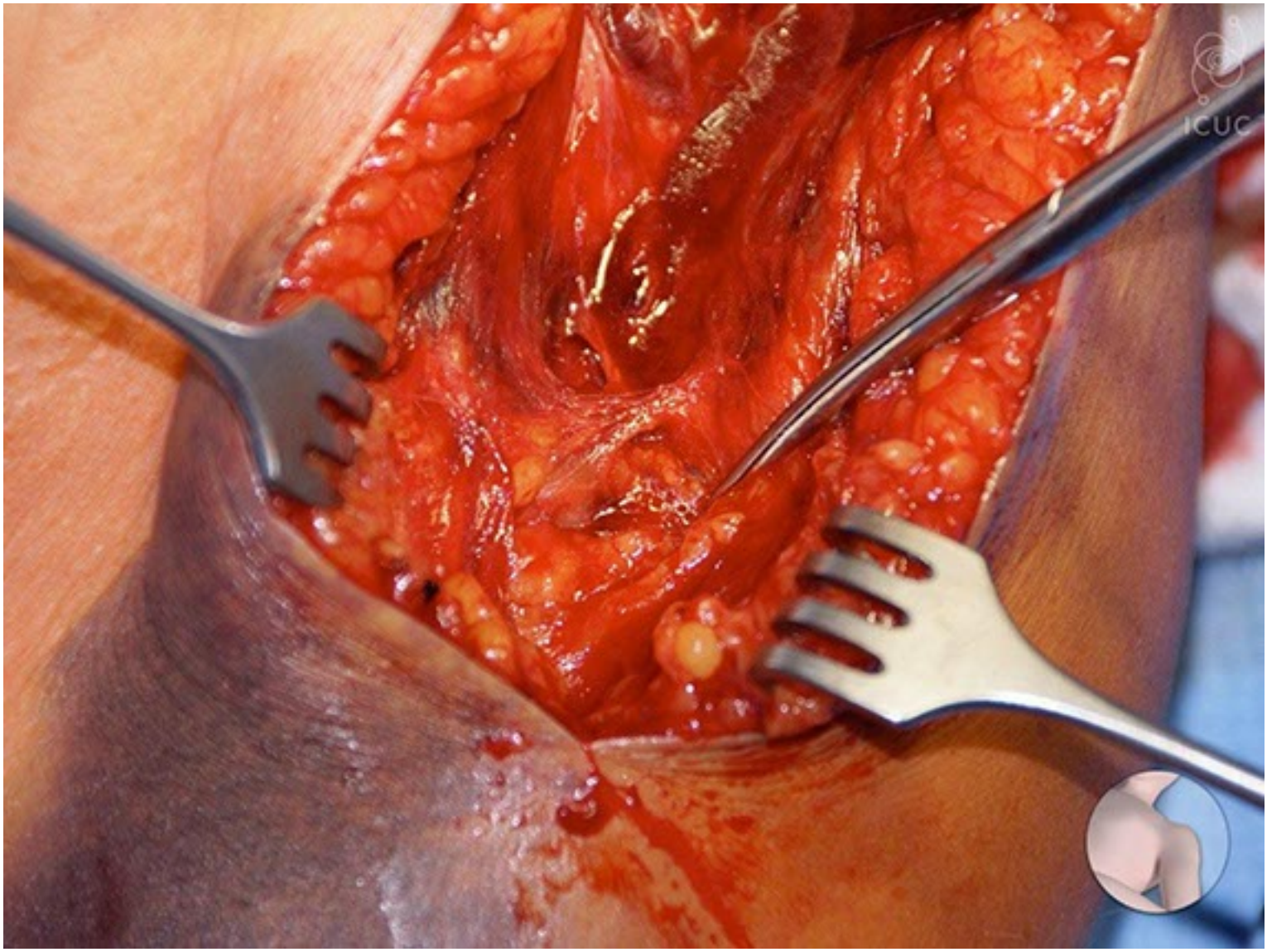
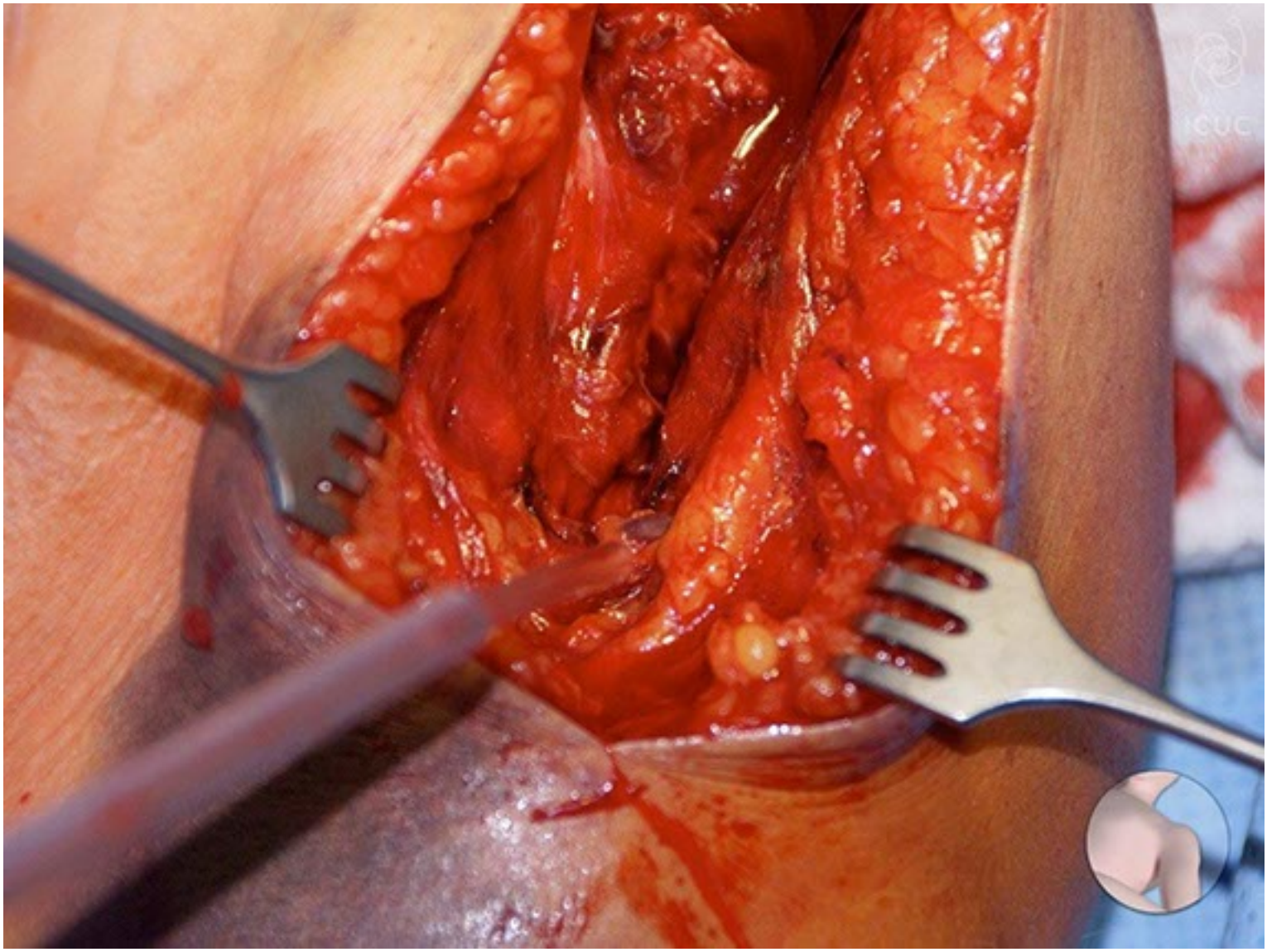
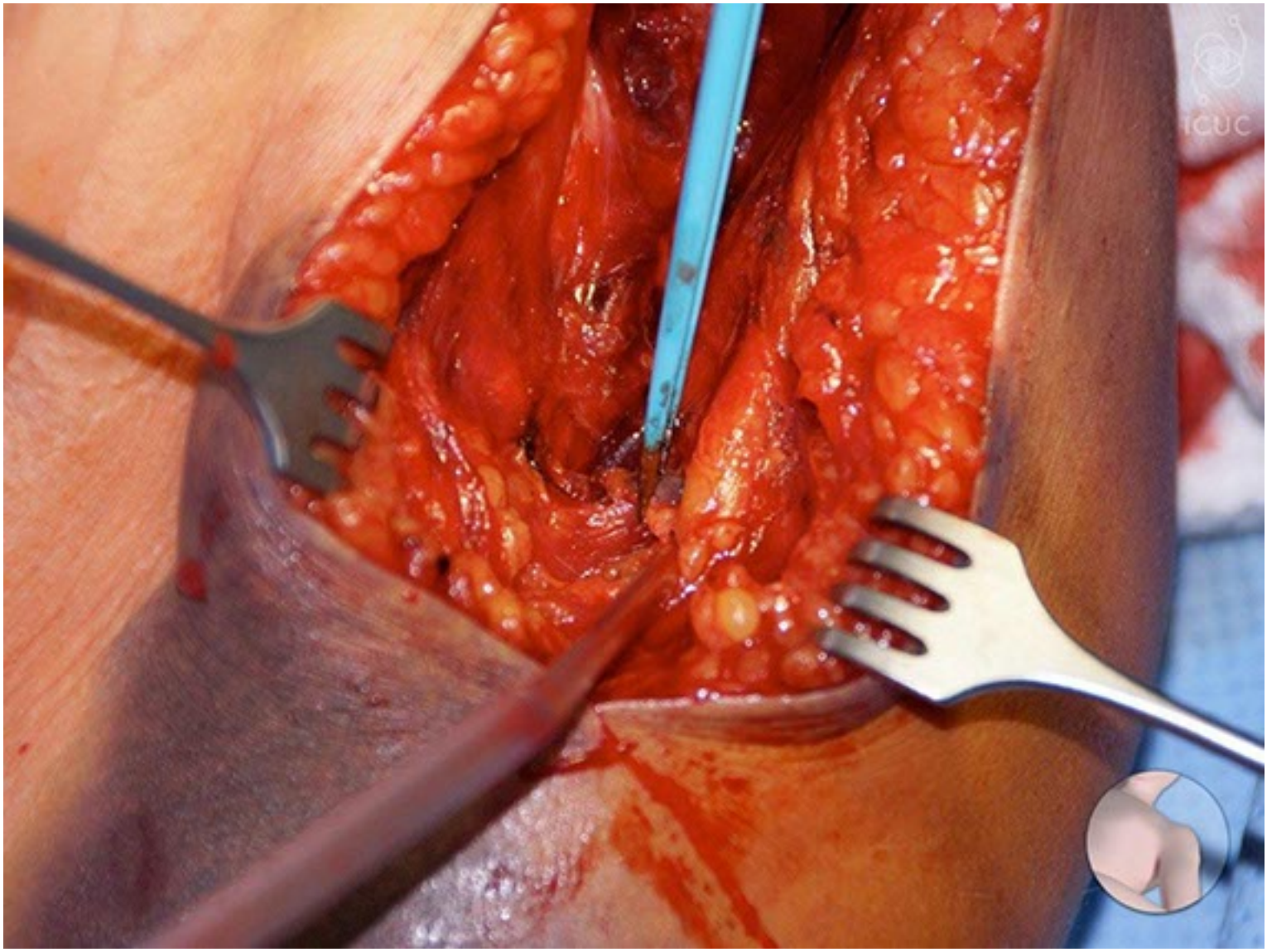

After opening the fascia, the retractor is placed around the proximal humerus.
The periosteum is stripped in the fracture line area.

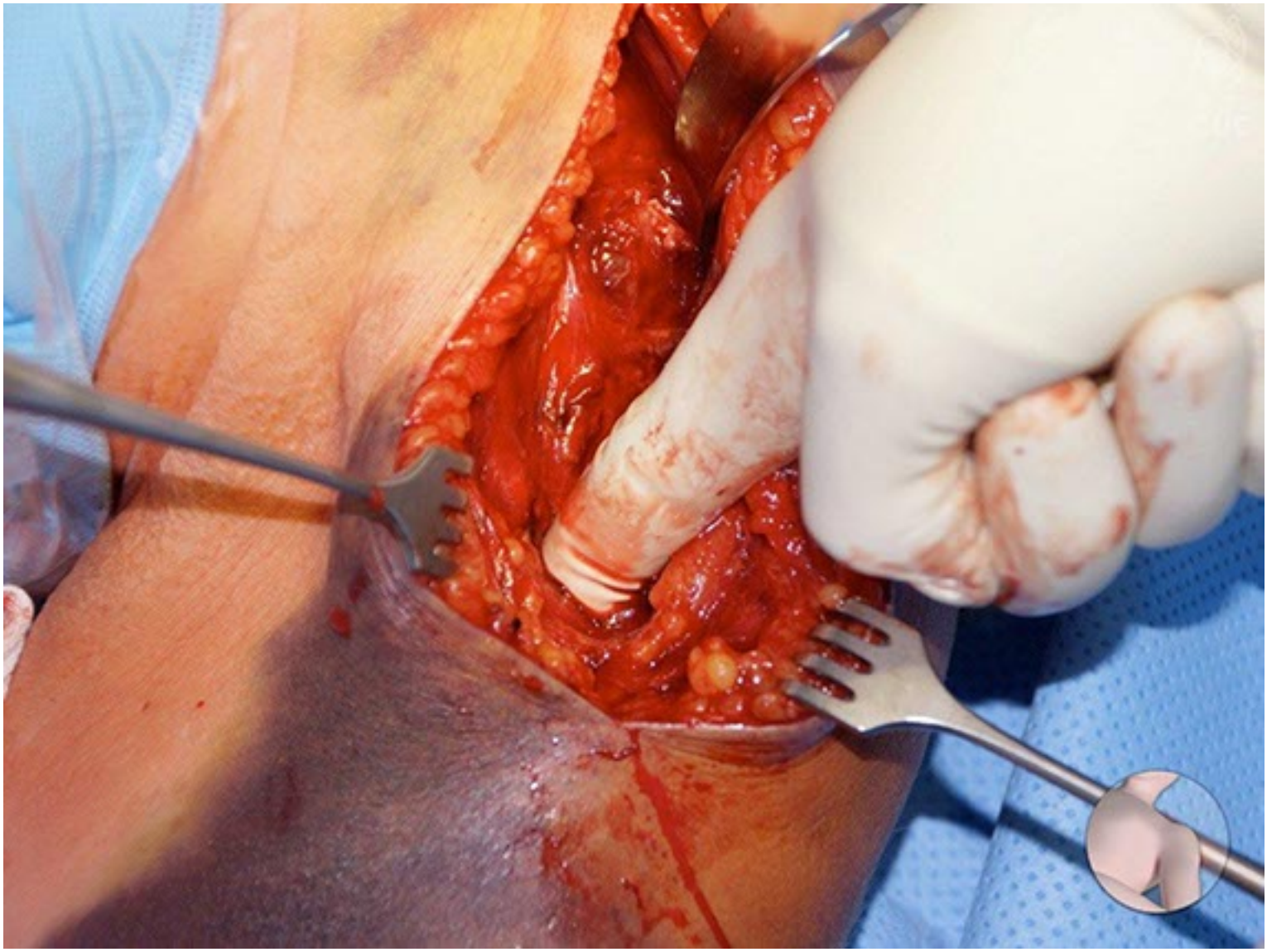


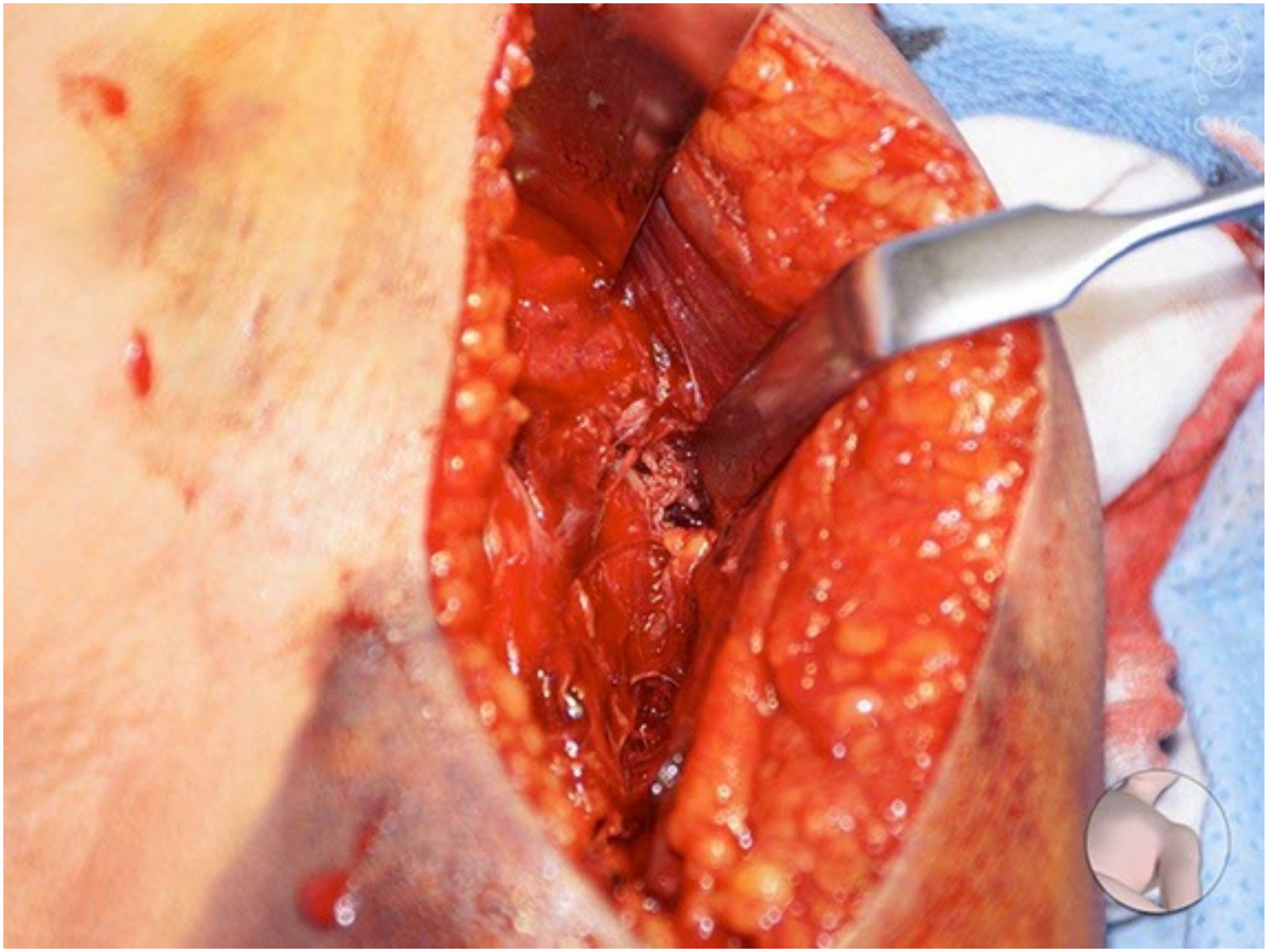










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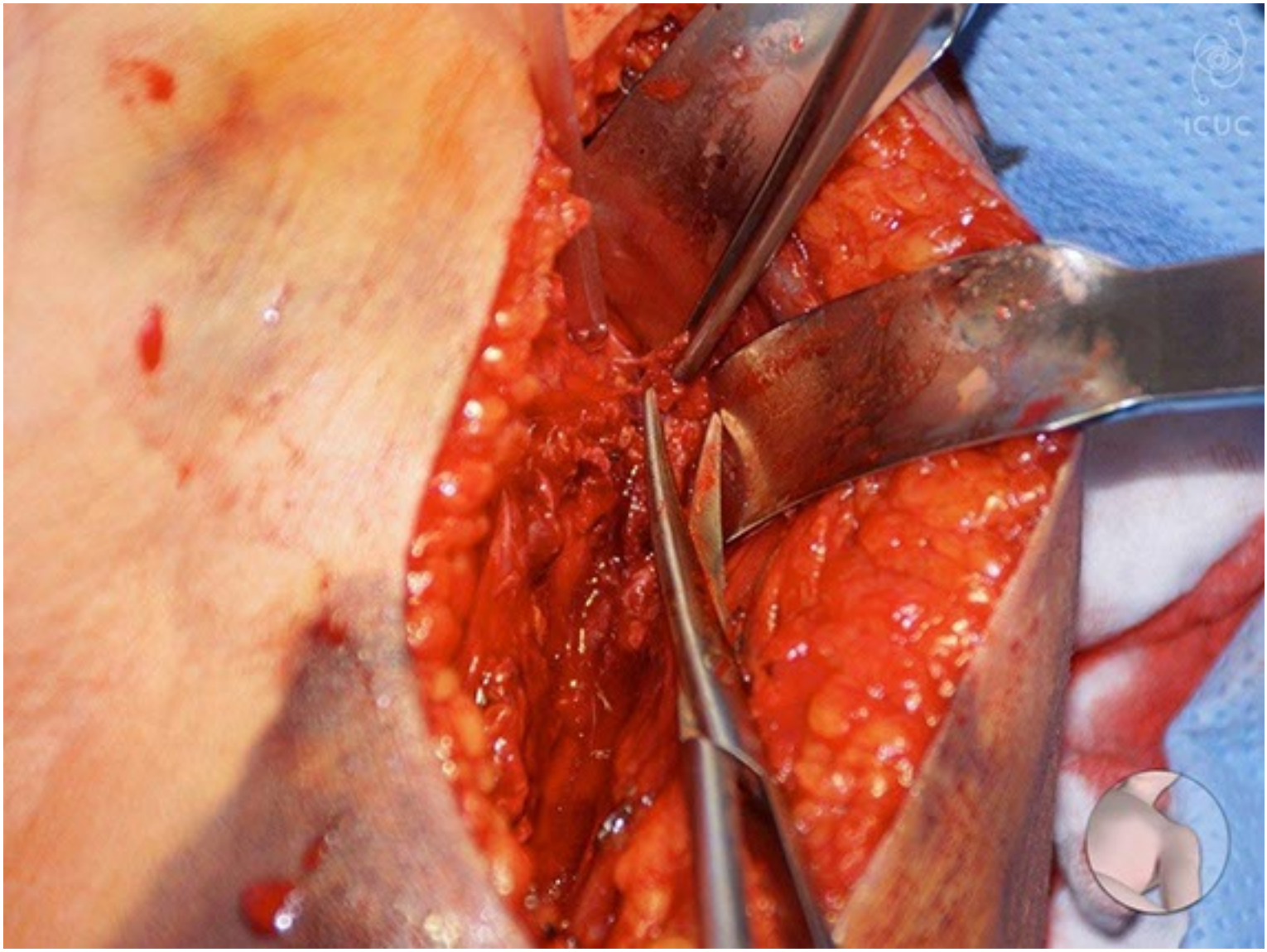
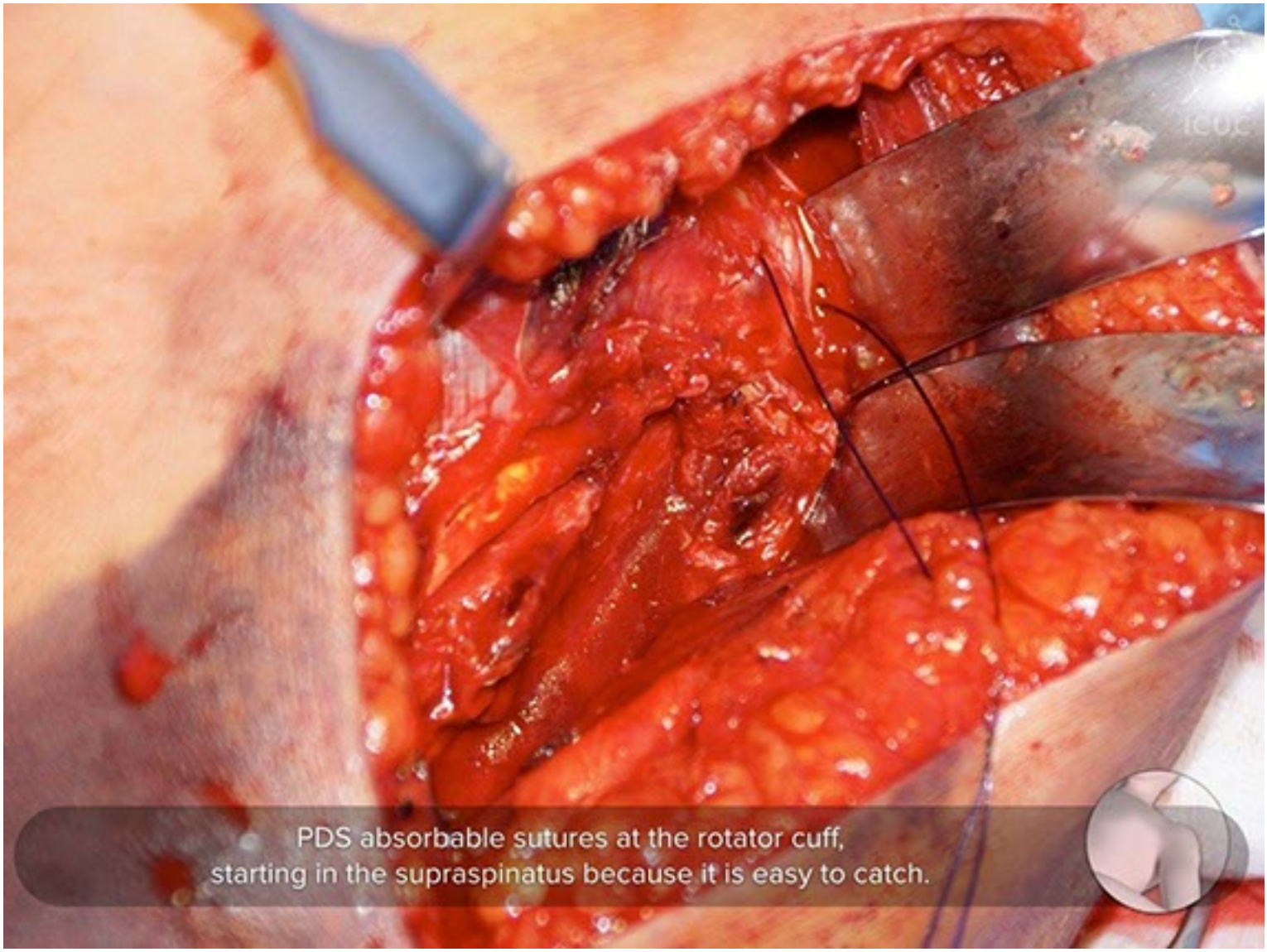
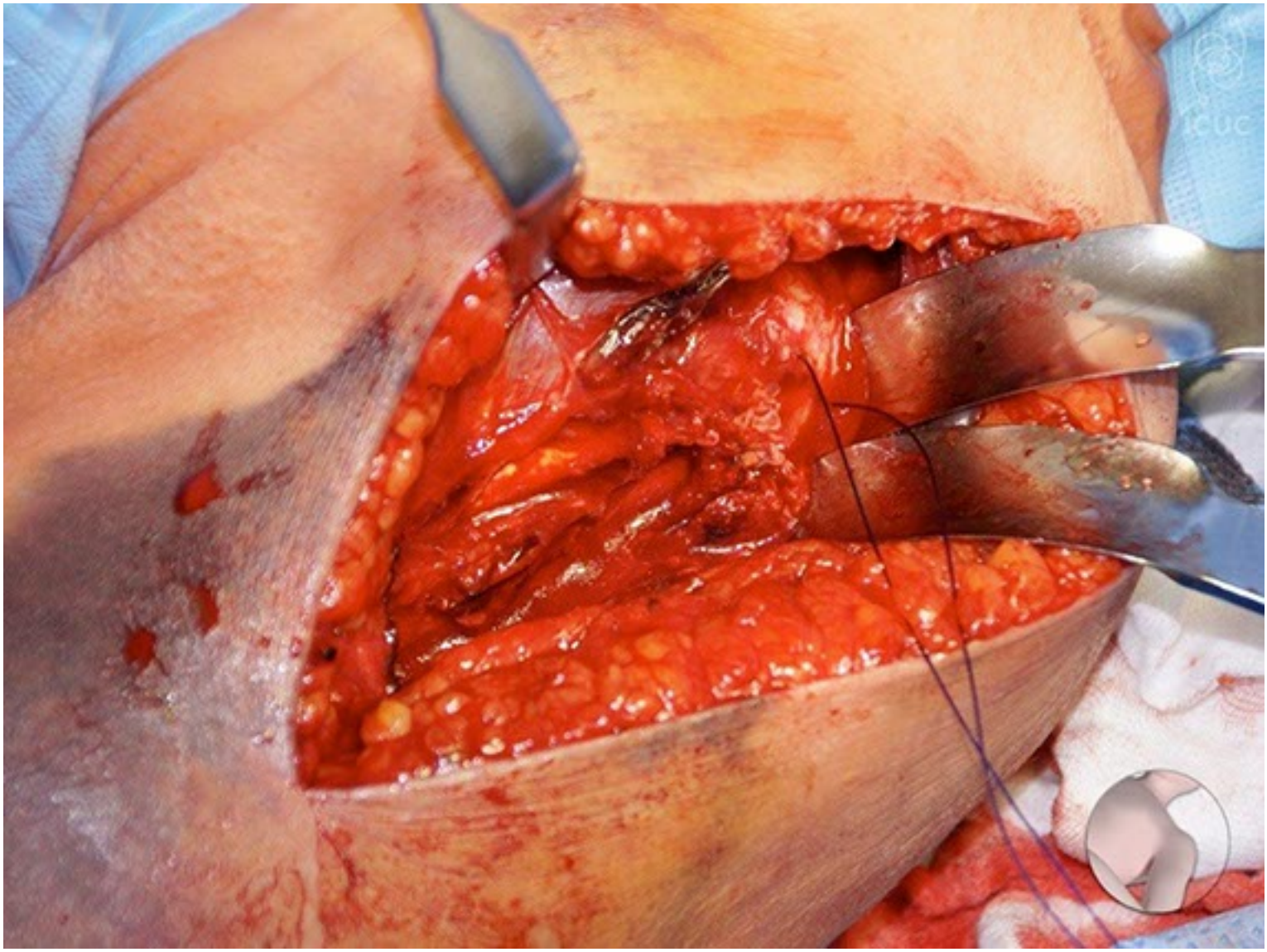
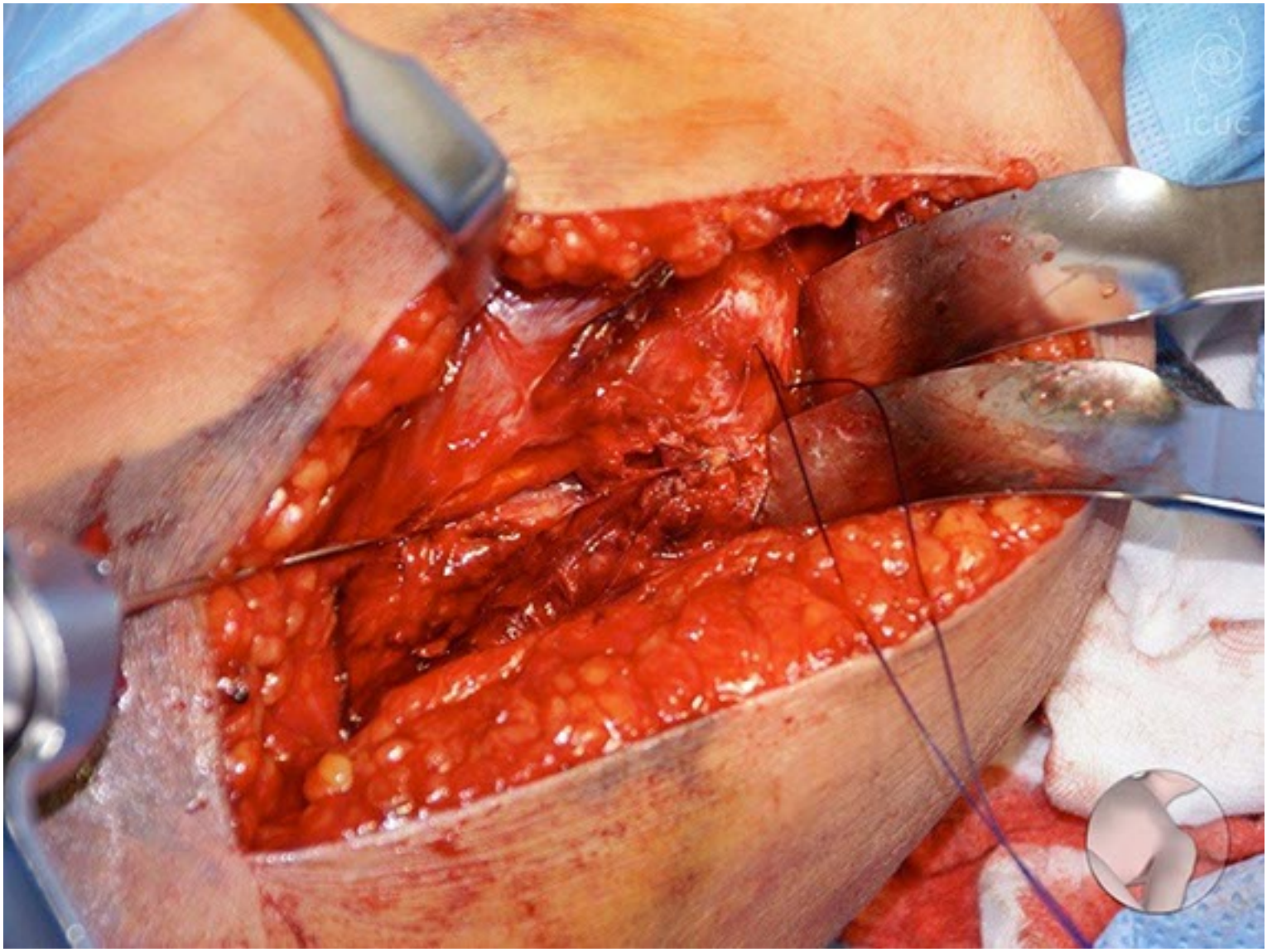
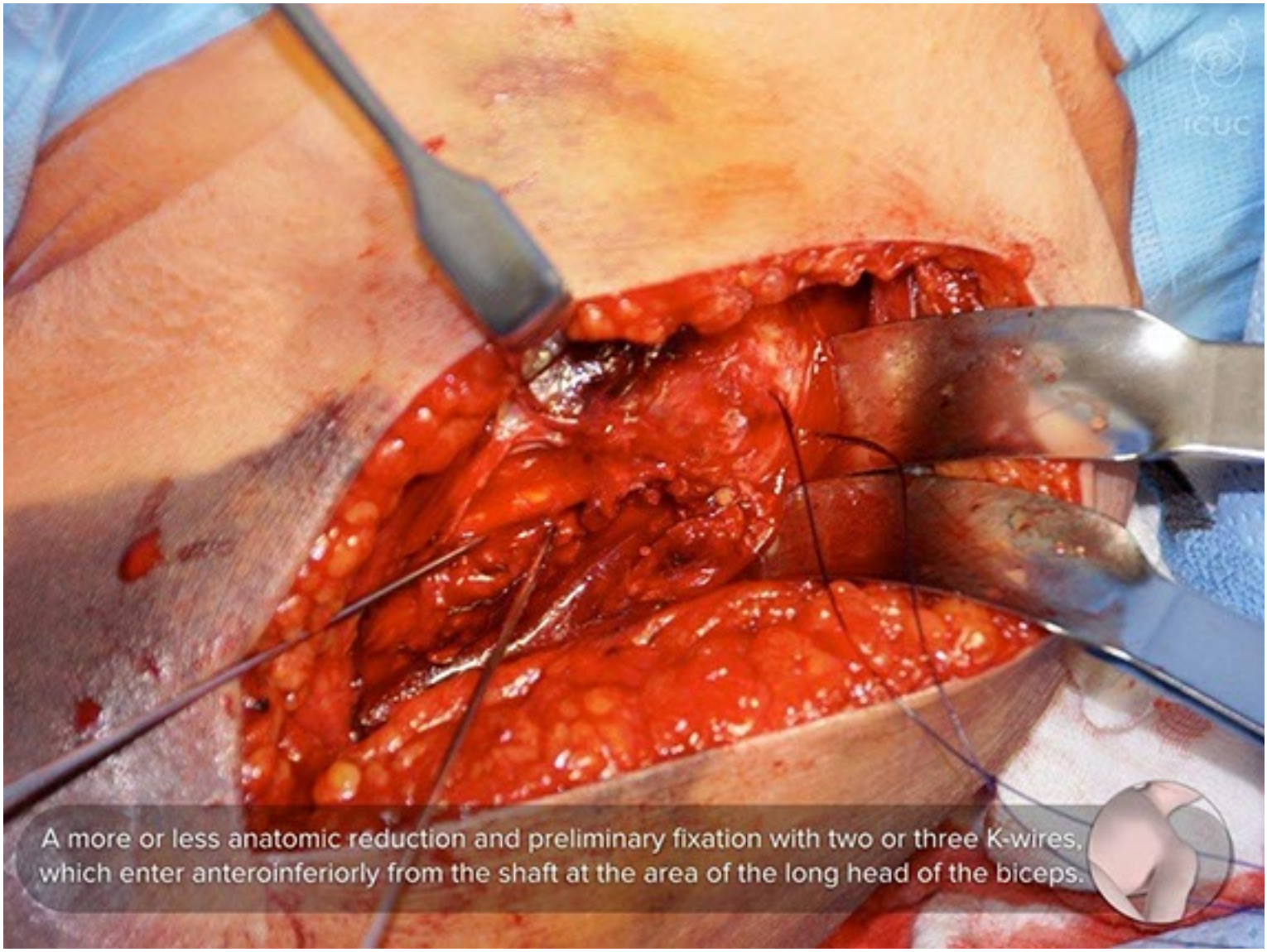


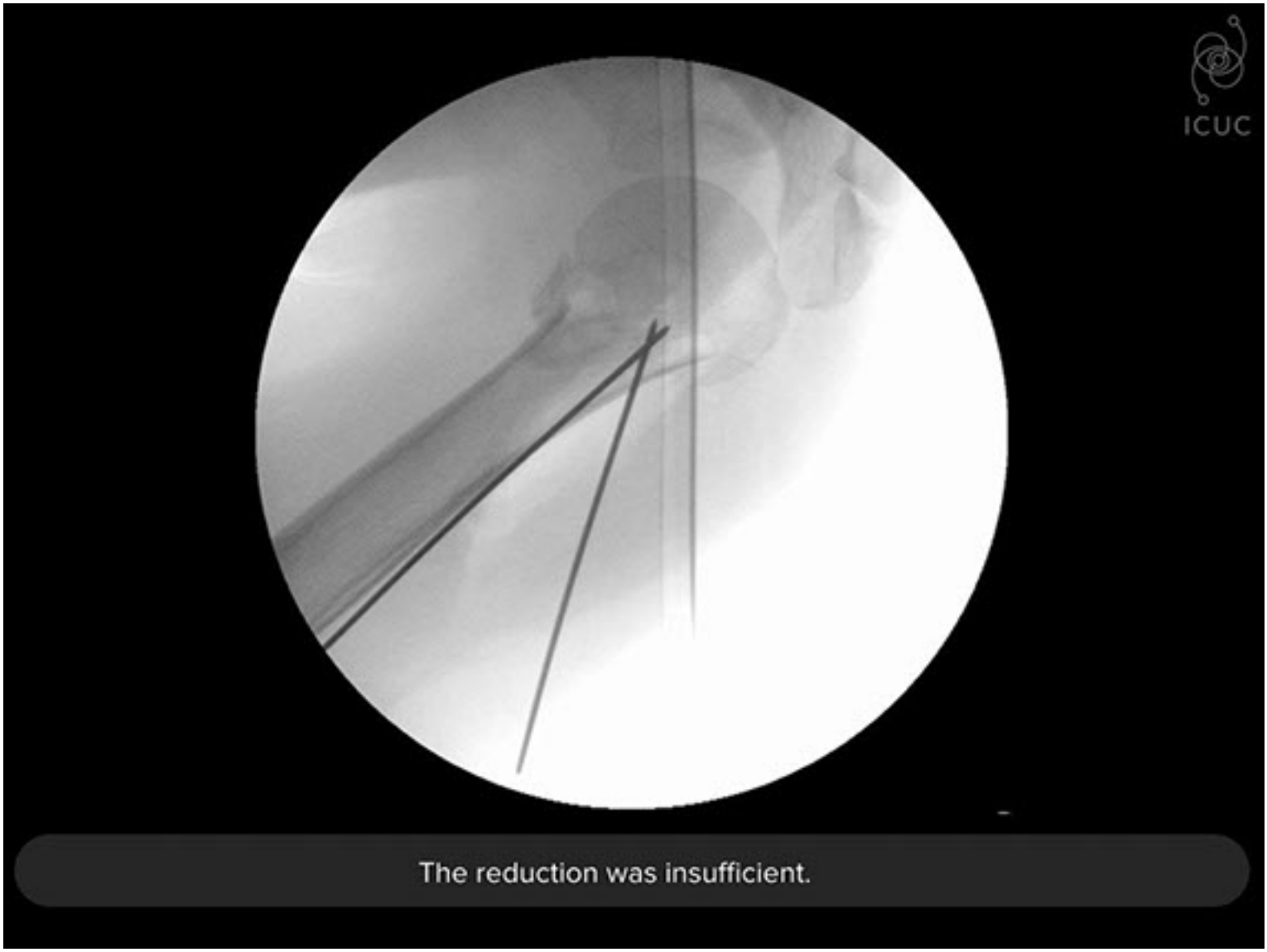

PDS absorbable sutures at the rotator cuff,
starting in the supraspinatus because it is easy to catch.






A more or less anatomic reduction and preliminary fixation with two or three K-wires,
which enter anteroinferiorly from the shaft at the area of the long head of the biceps.


This is an open reduction under C-arm control. If it is sufficient, they will proceed.
If it is insufficient, they should remove the K-wires and repeat the reduction maneuver.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The reduction was insufficient.


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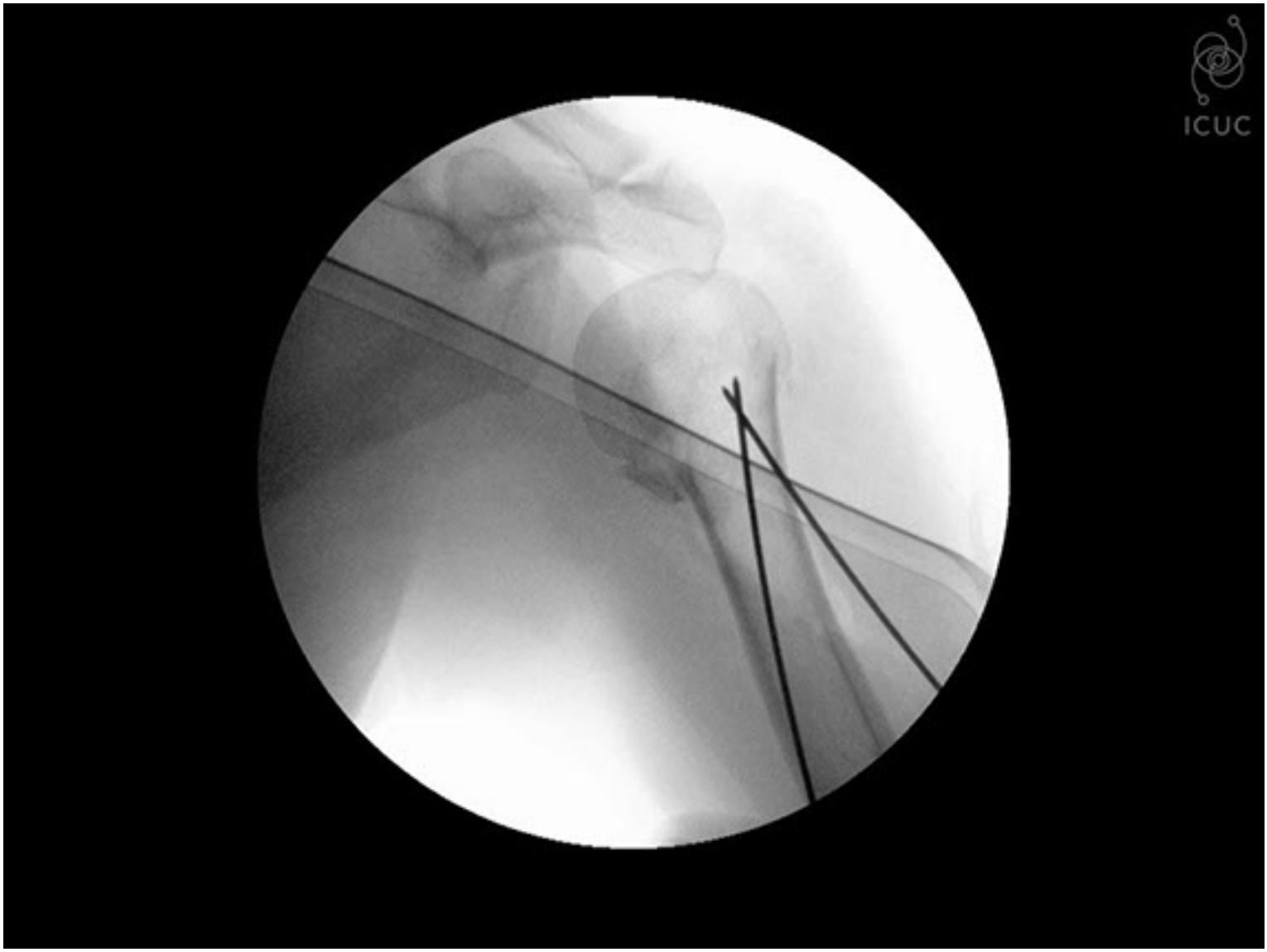
They took it out again.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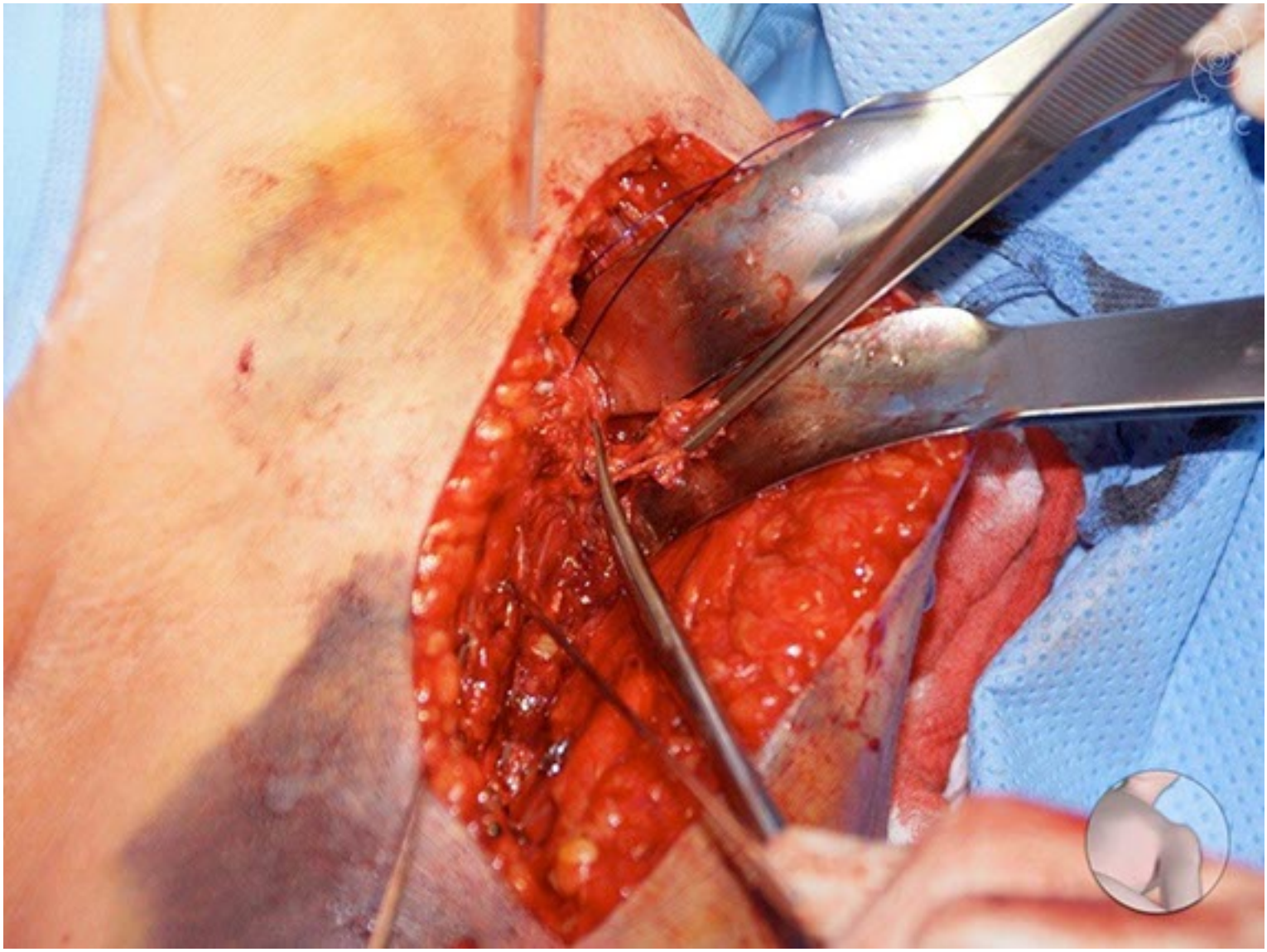
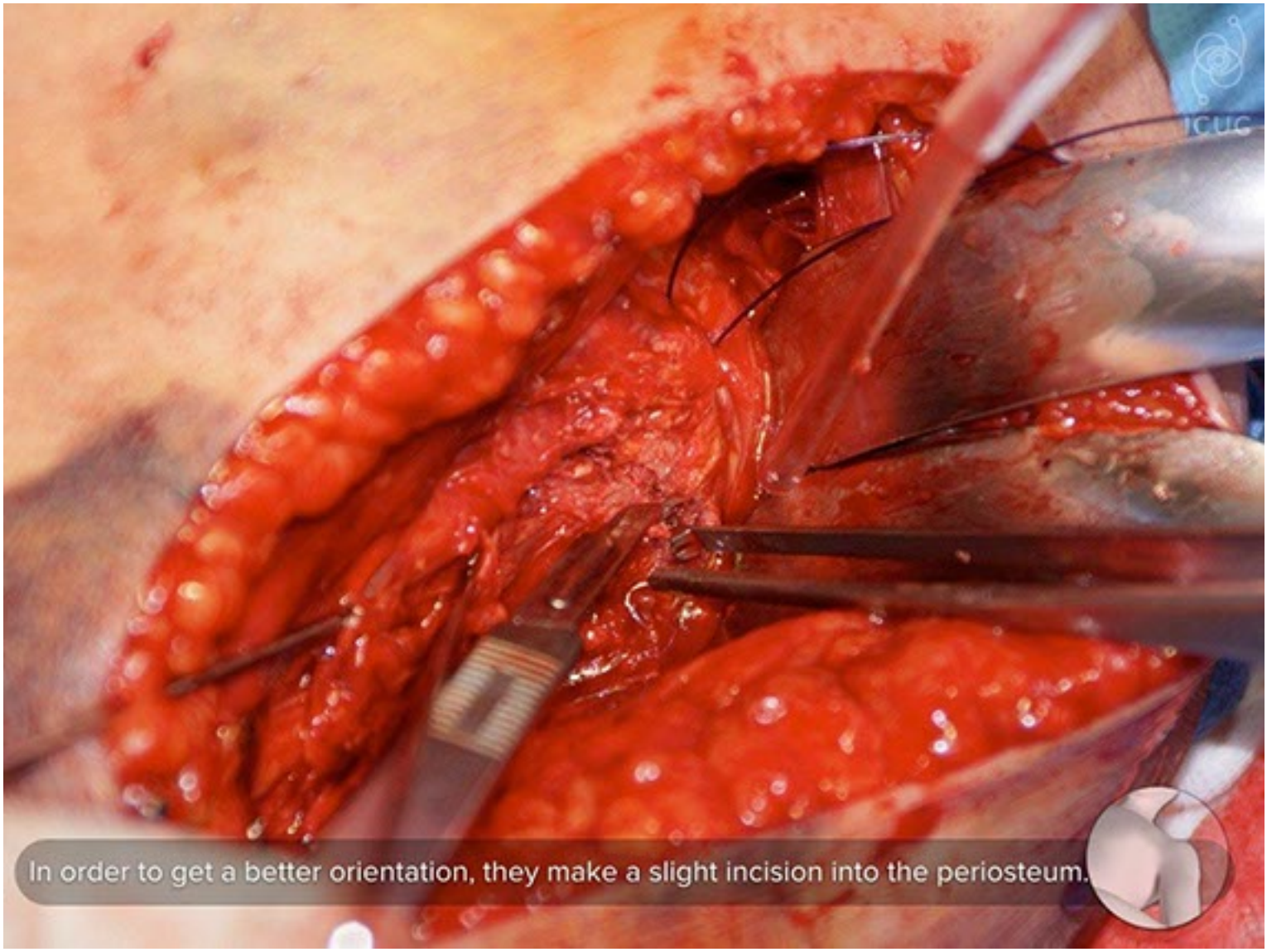
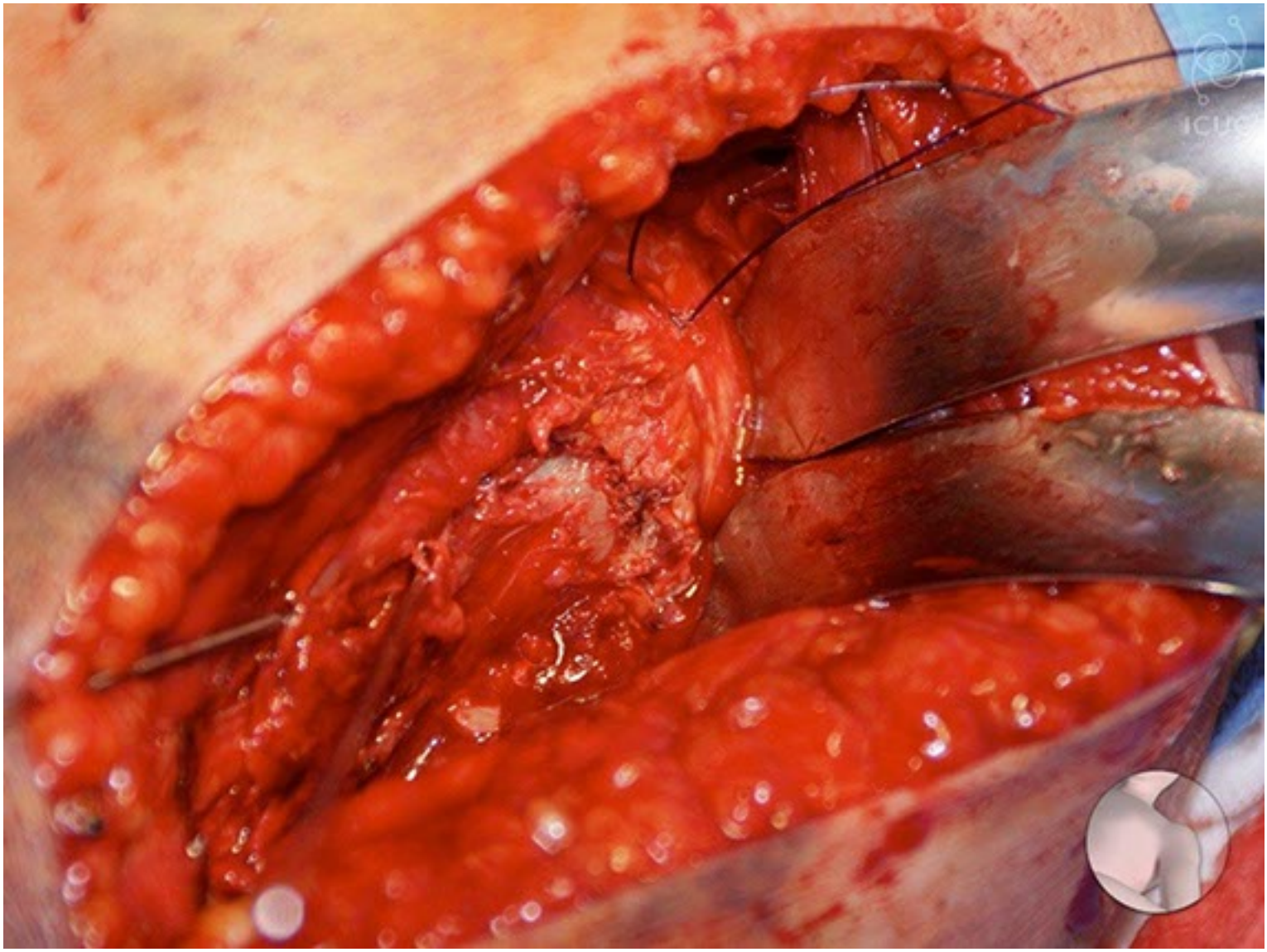
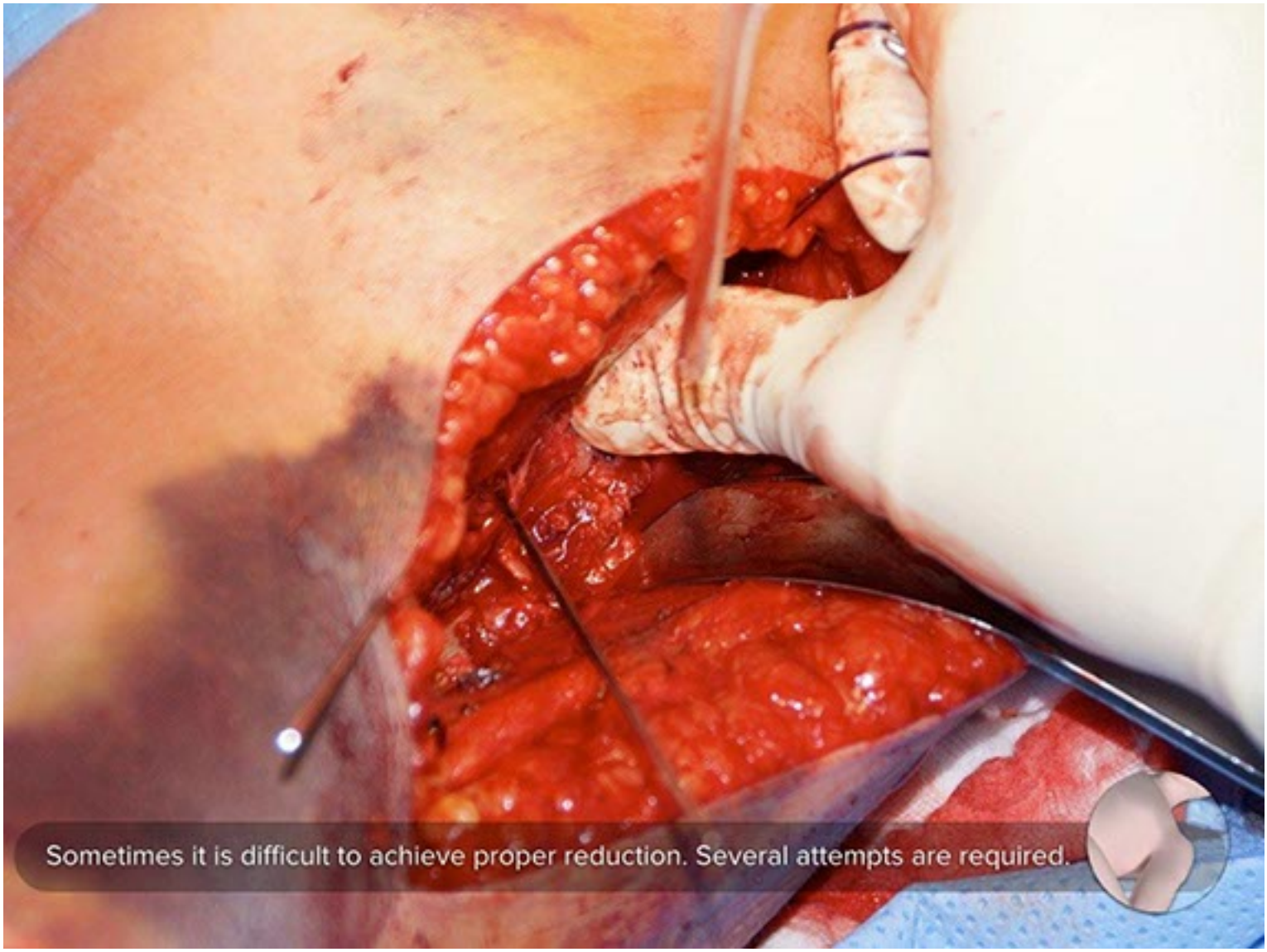
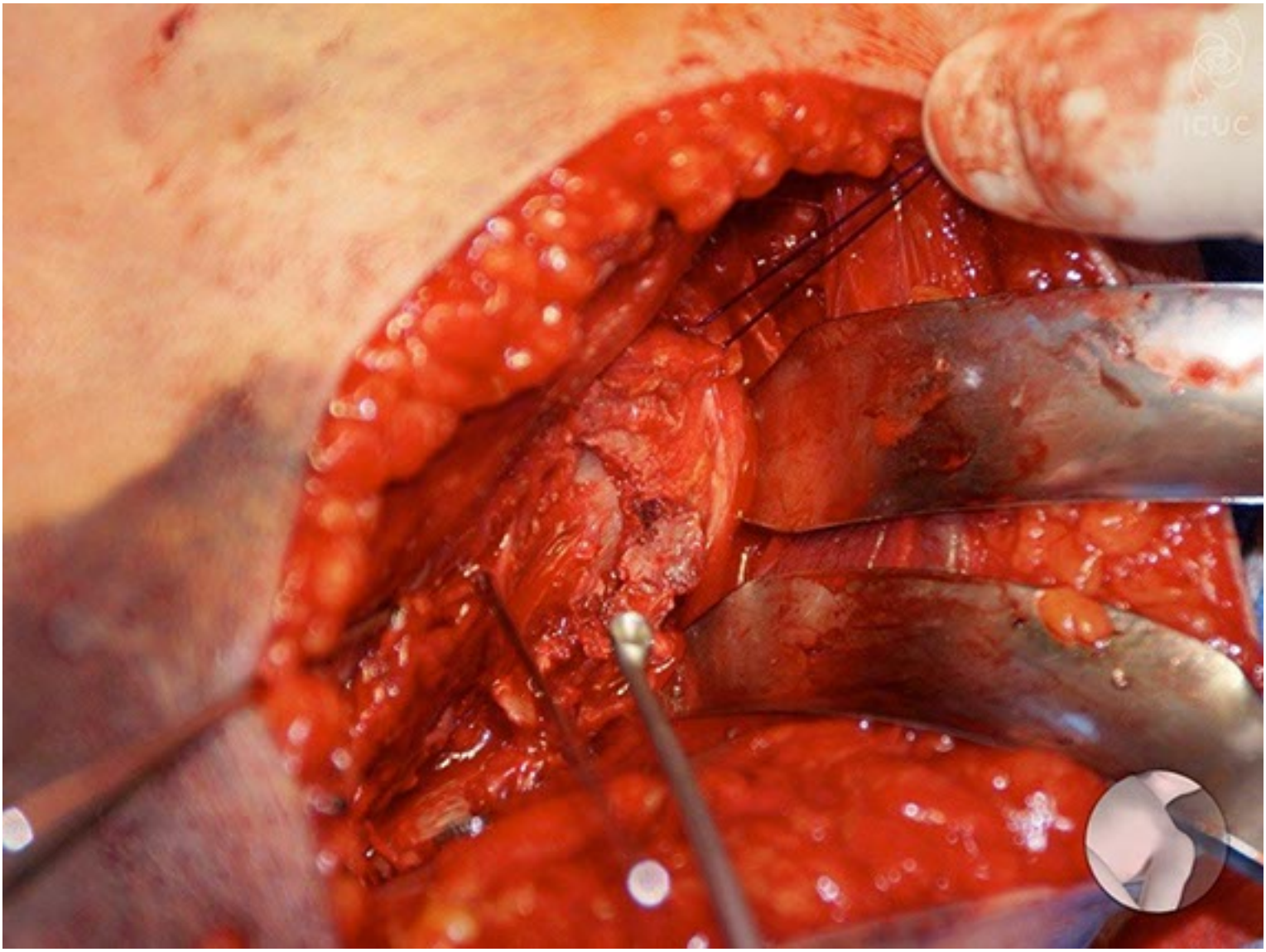
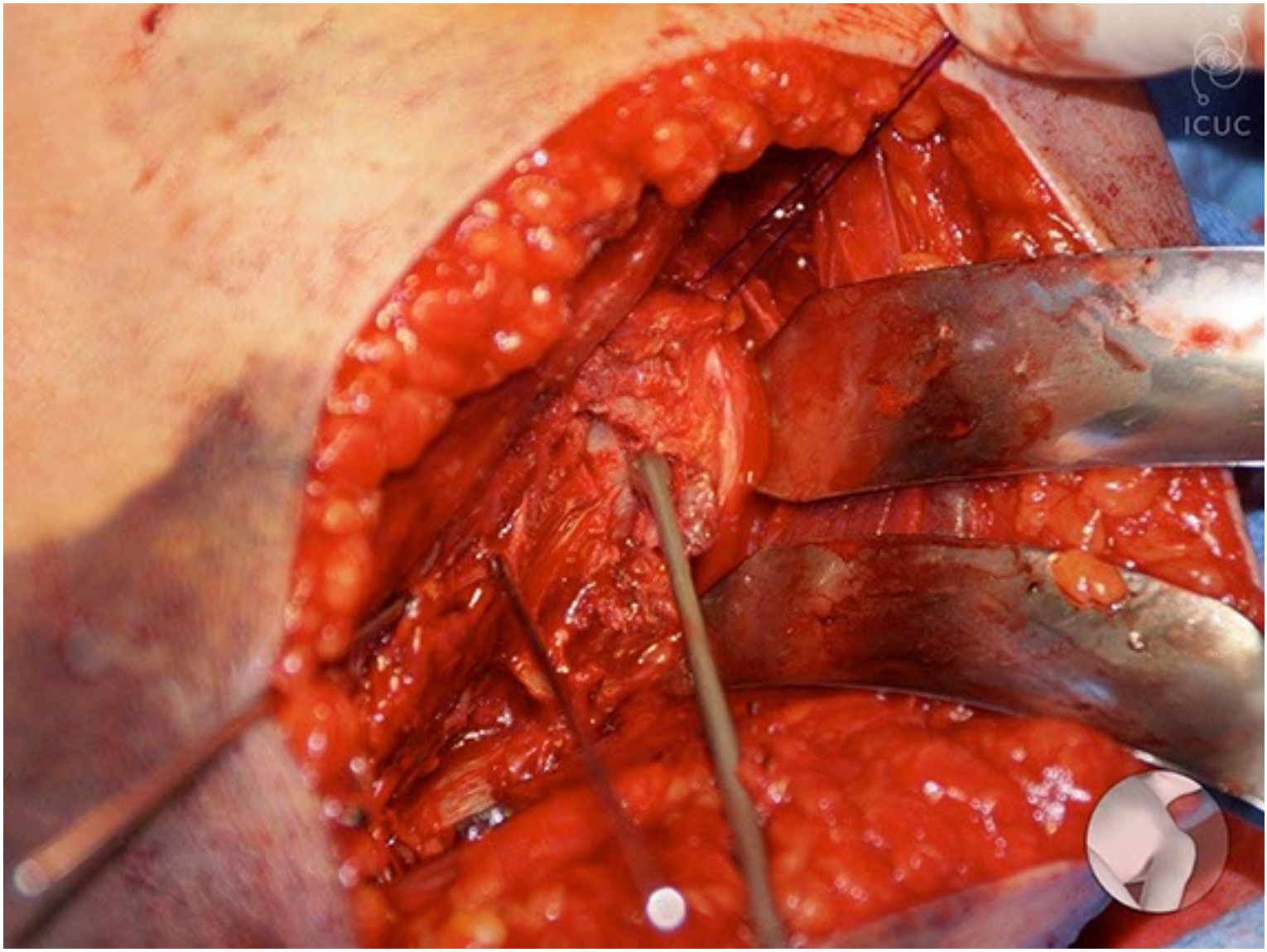



In order to get a better orientation, they make a slight incision into the periosteum.




Sometimes it is difficult to achieve proper reduction. Several attempts are required.

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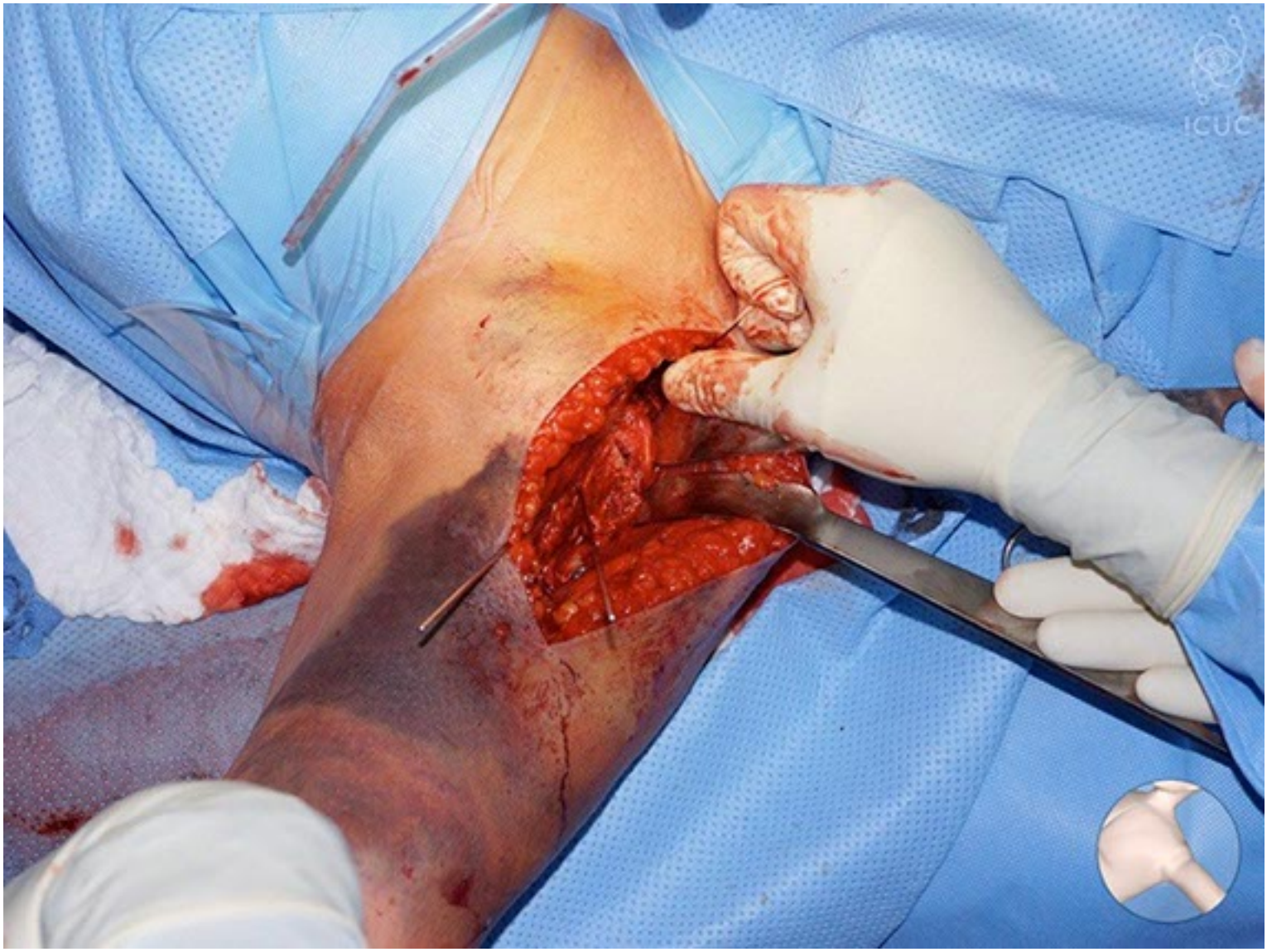

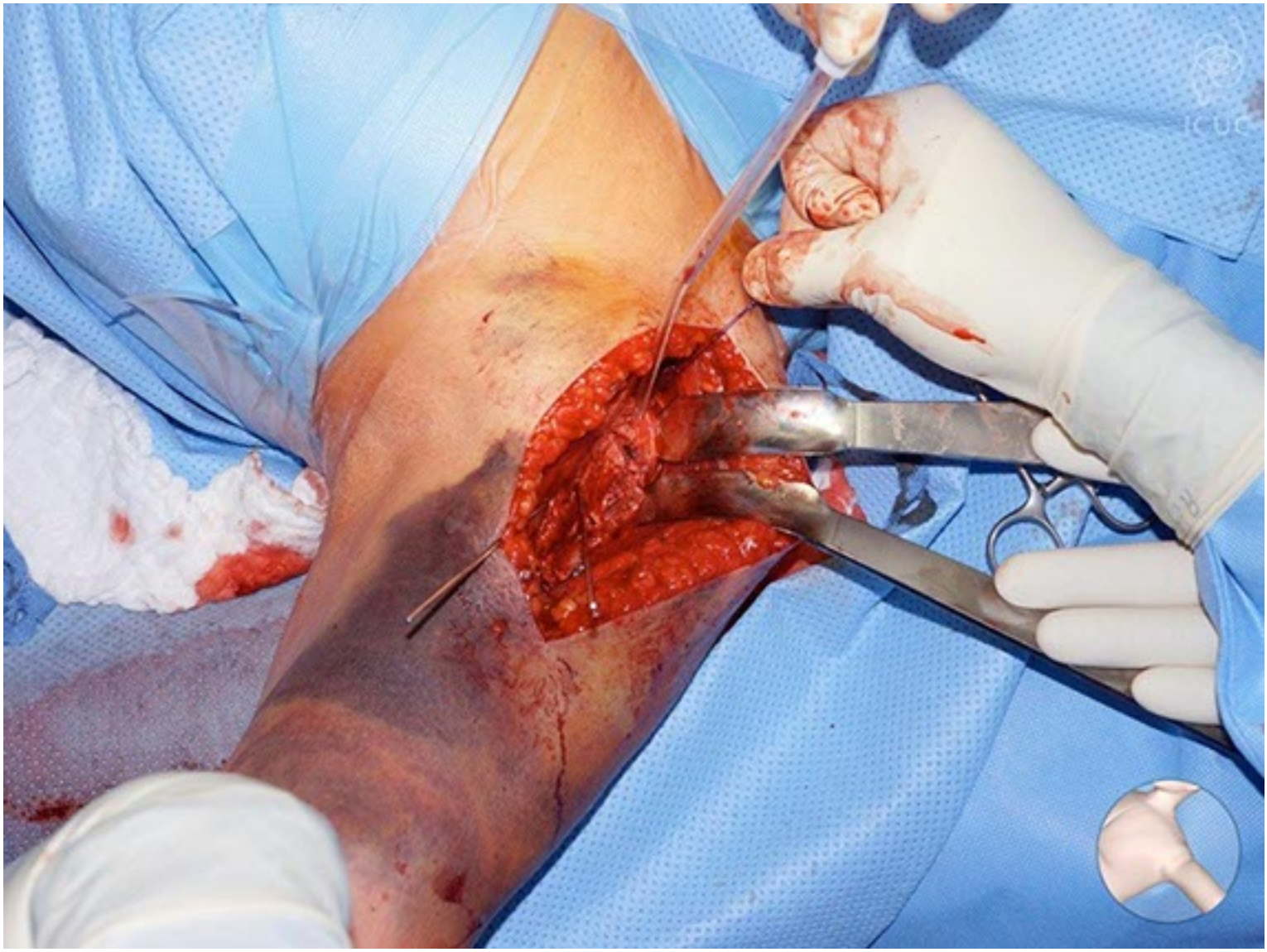

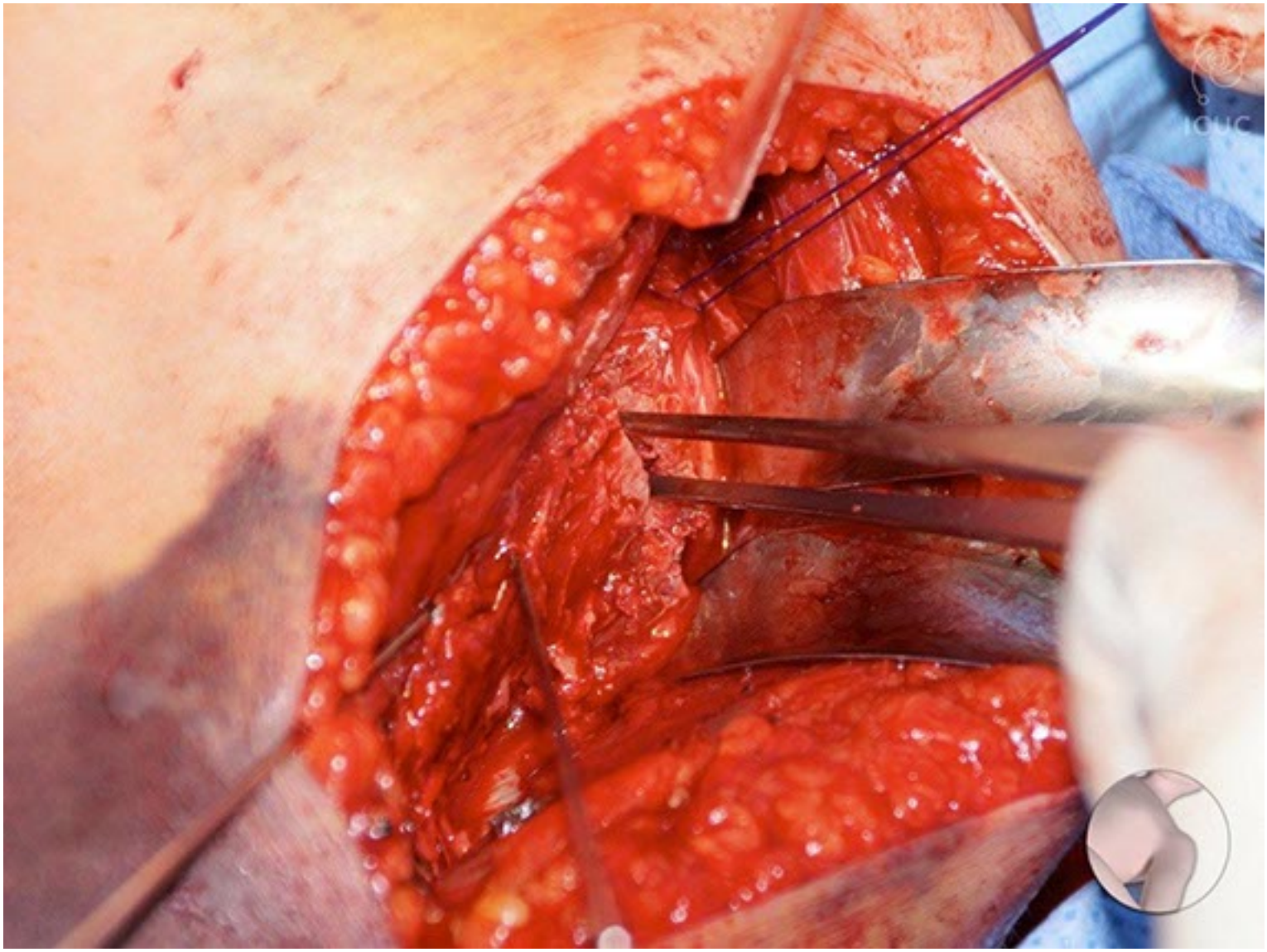

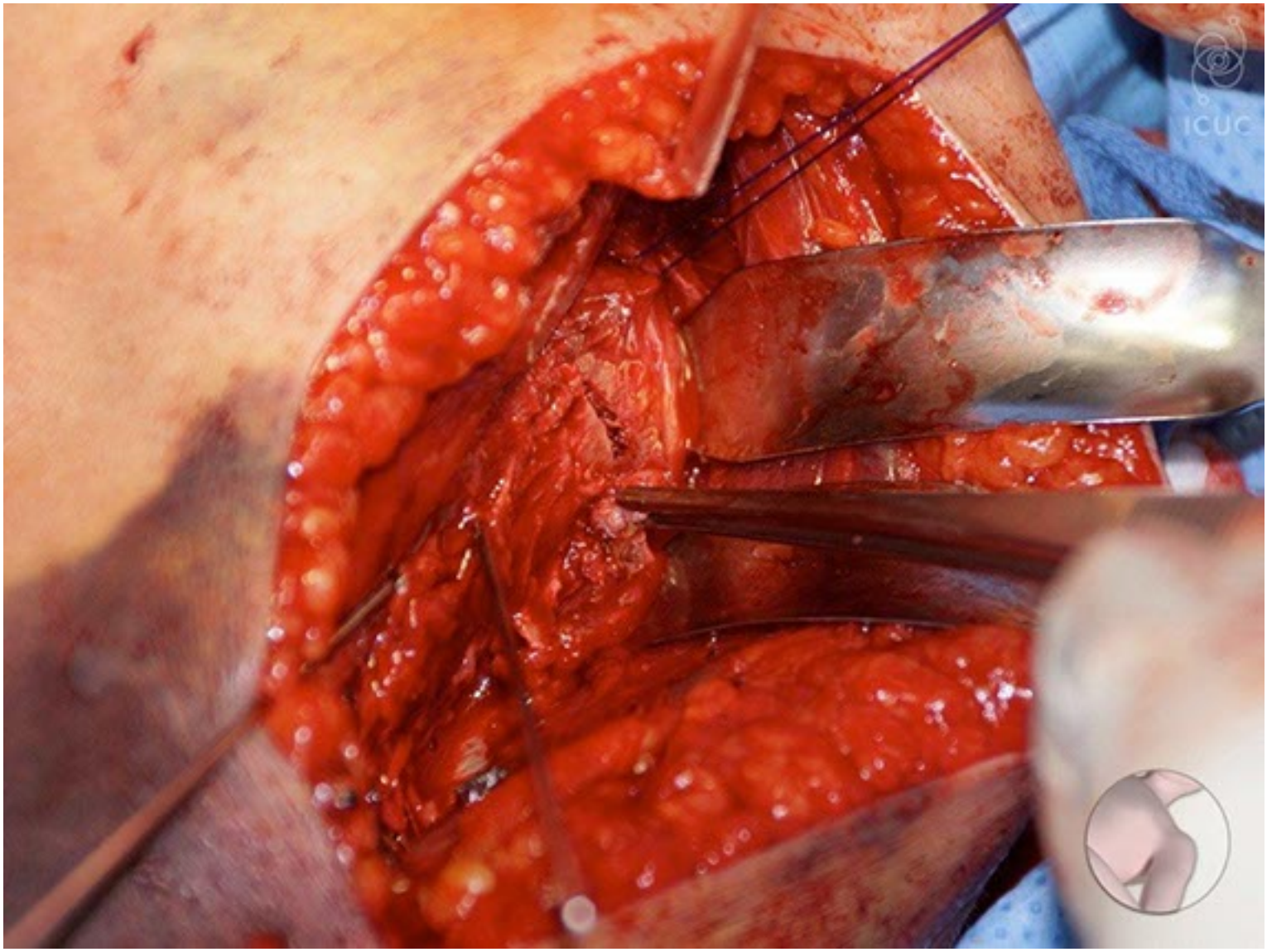

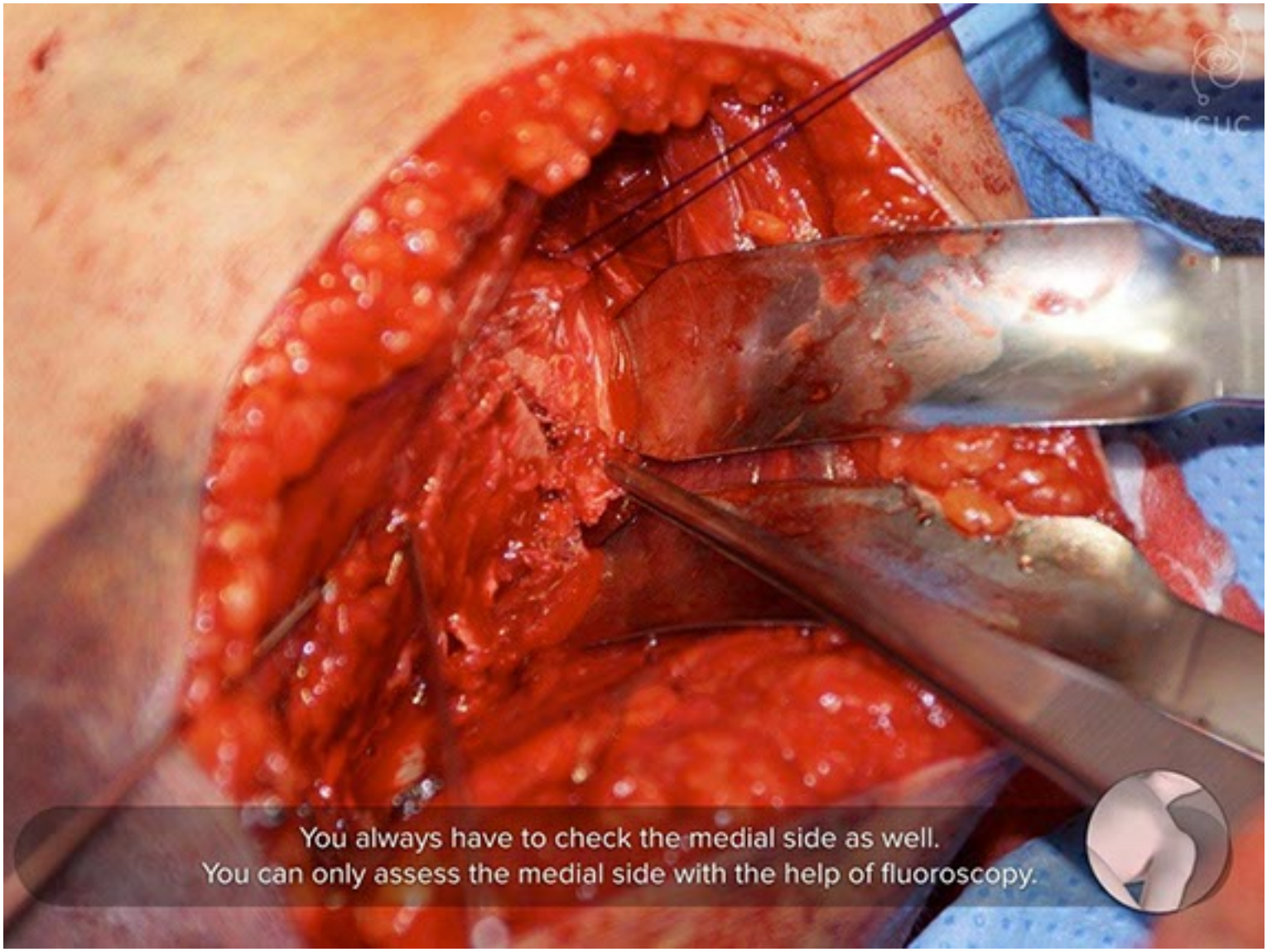
You always have to check the medial side as well.
You can only assess the medial side with the help of fluoroscopy.


If the head is in an anatomic position with respect to varus/valgus,
then the head is properly loaded. Medial comminution may be acceptable
as long as the periosteum is more or less intact
and the fragments are not spread too much.


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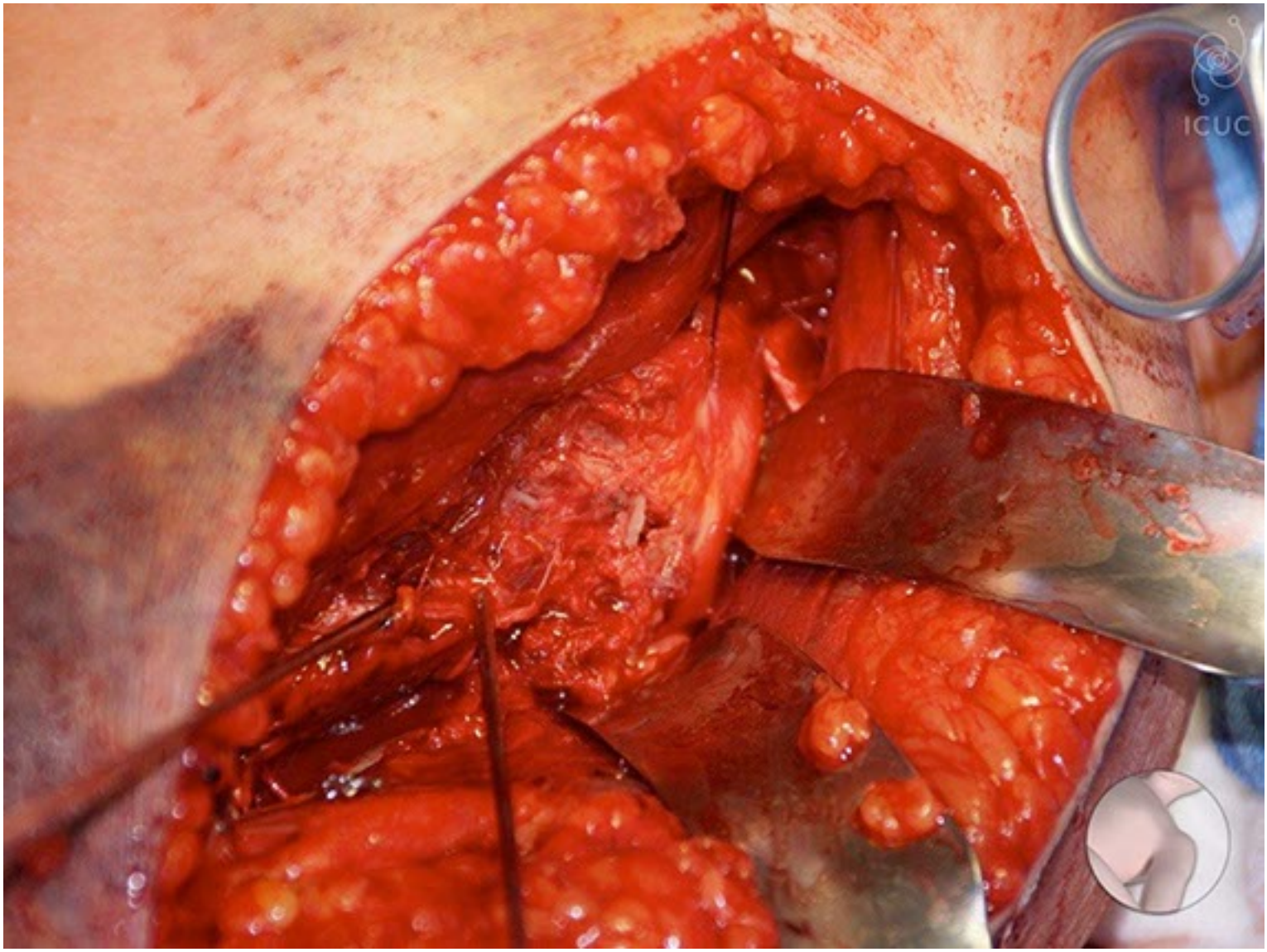
I would leave the soft tissue intact as long as possible
in order not to disturb blood supply.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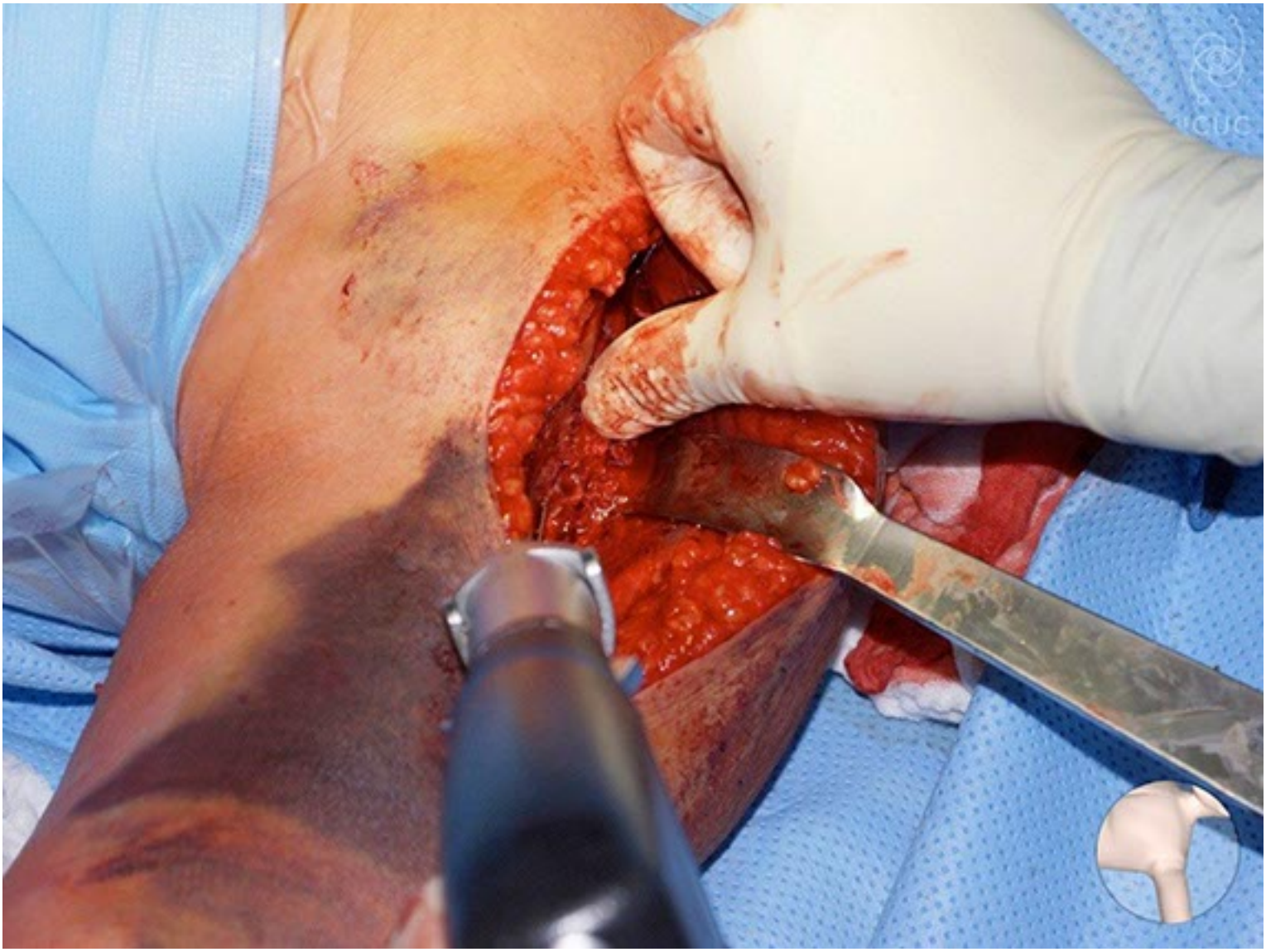


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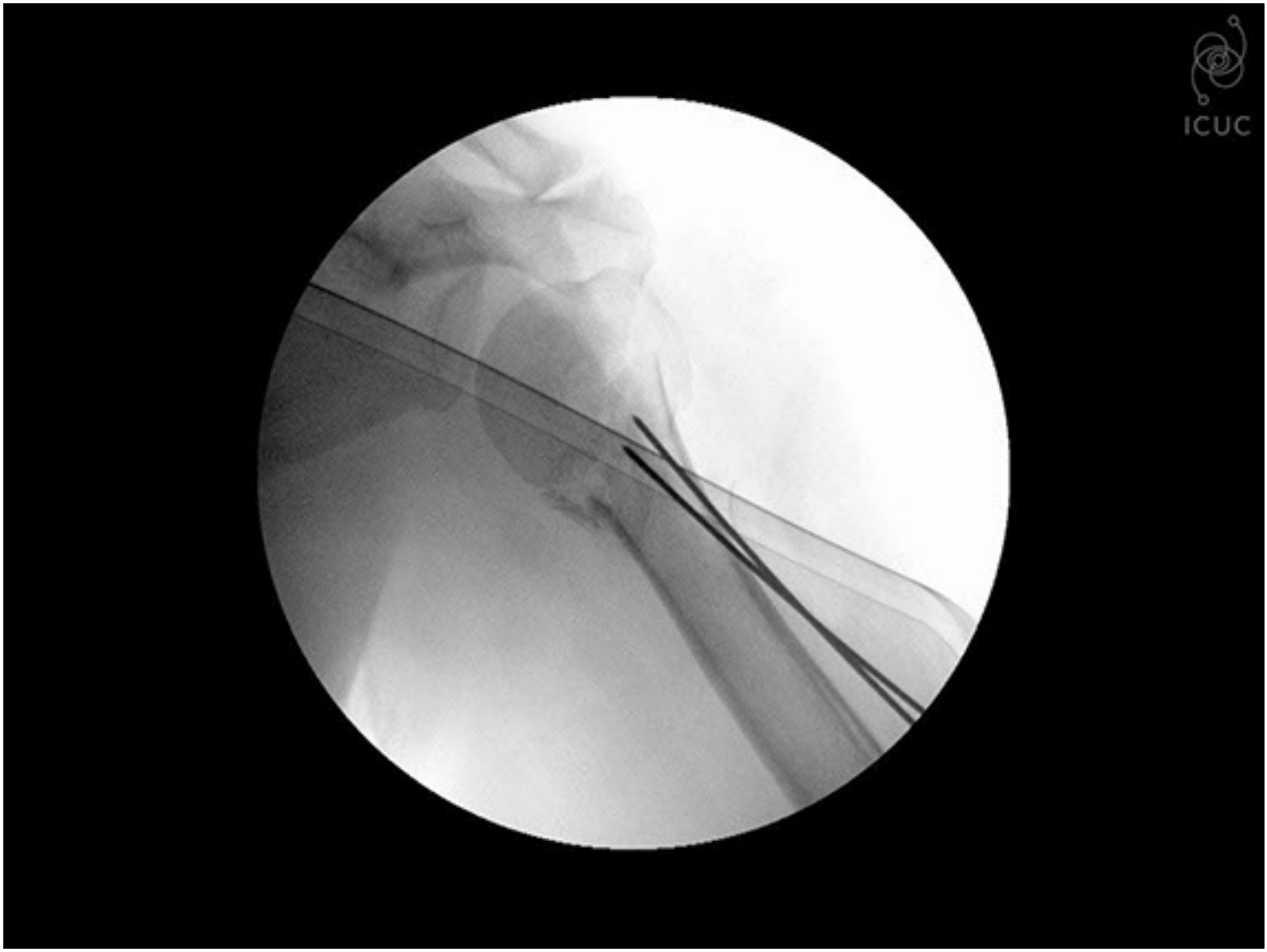
The reduction is insufficient. K-wires are removed once more.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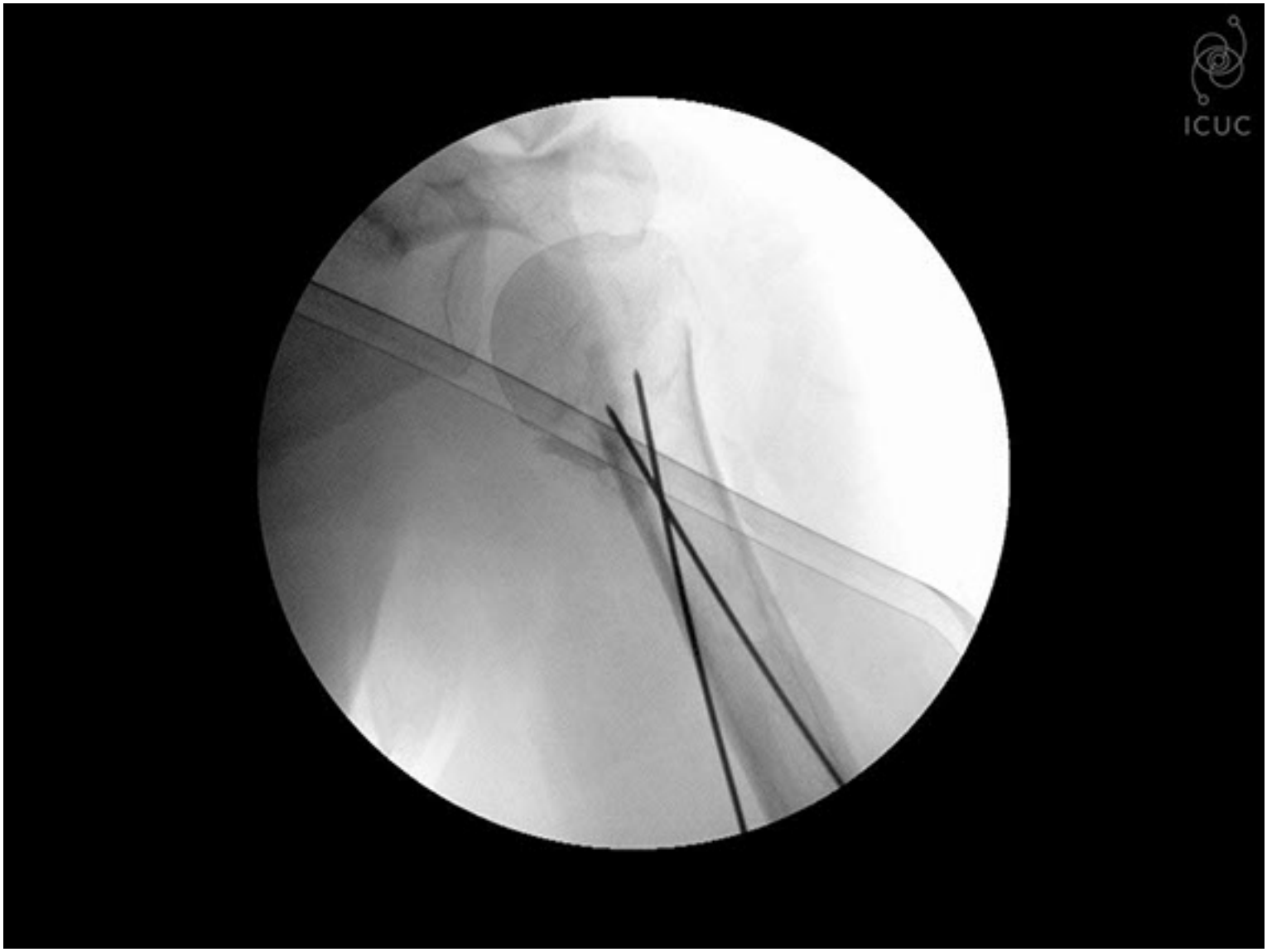
Several reduction attempts are made.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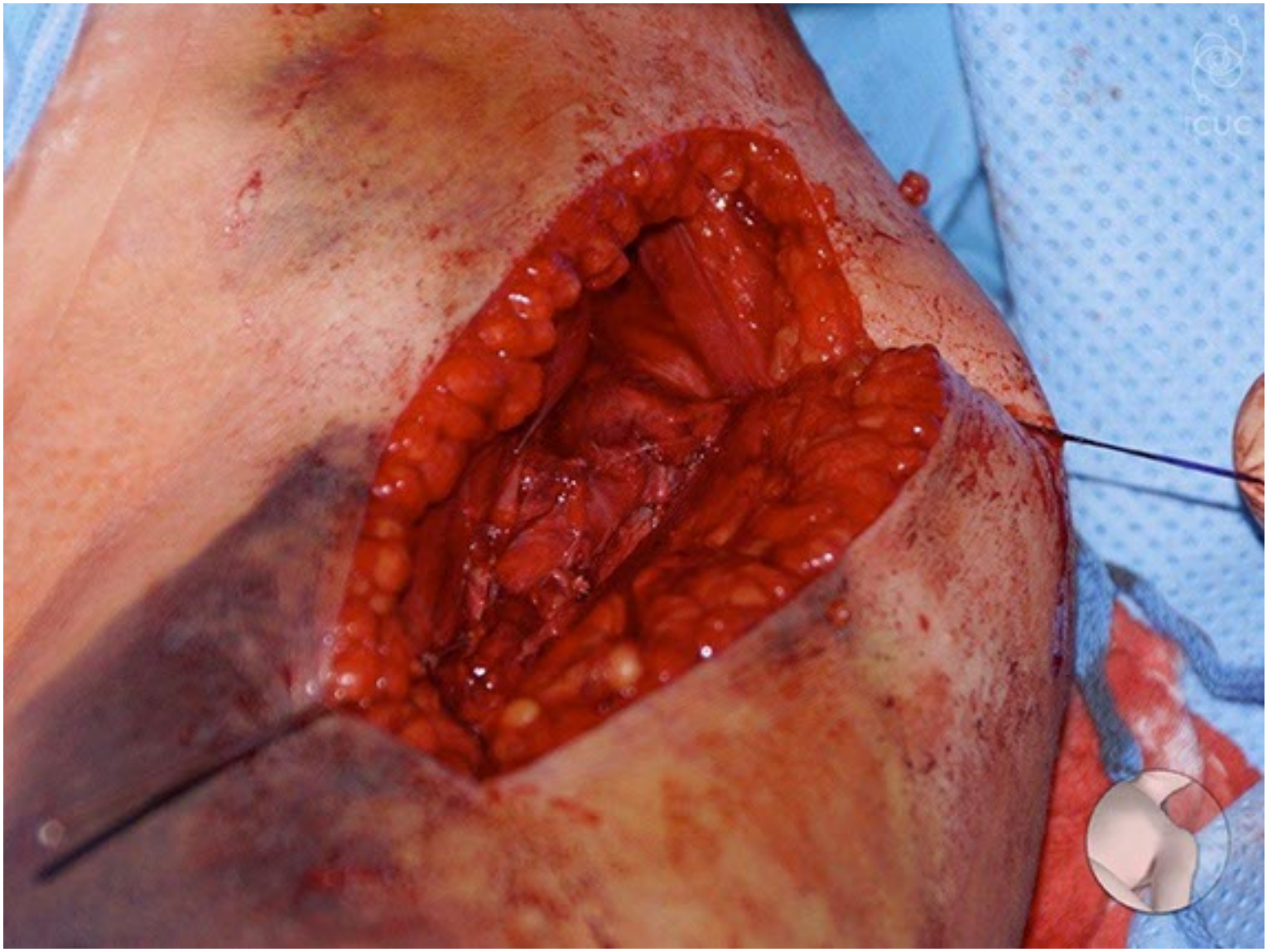
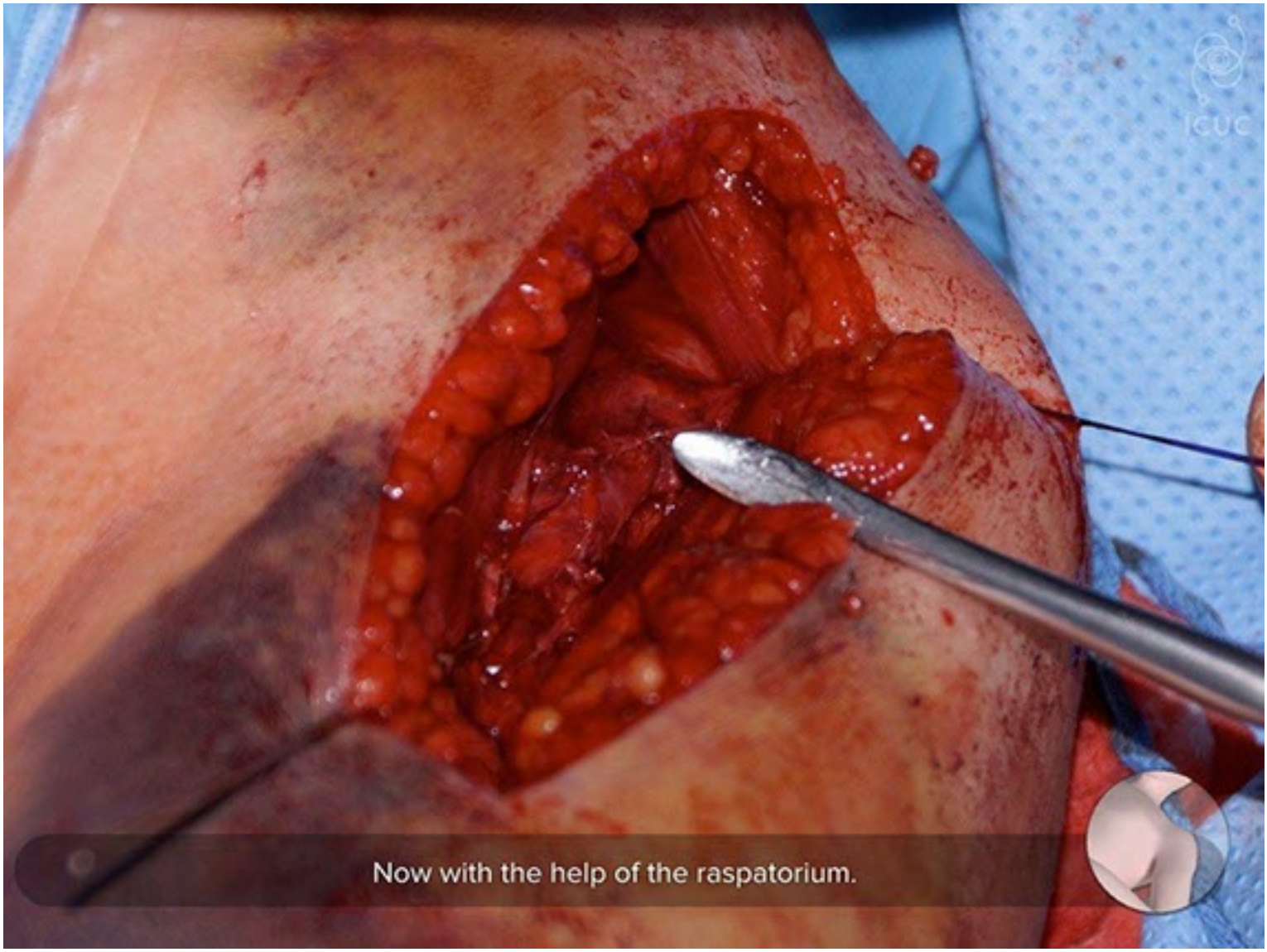
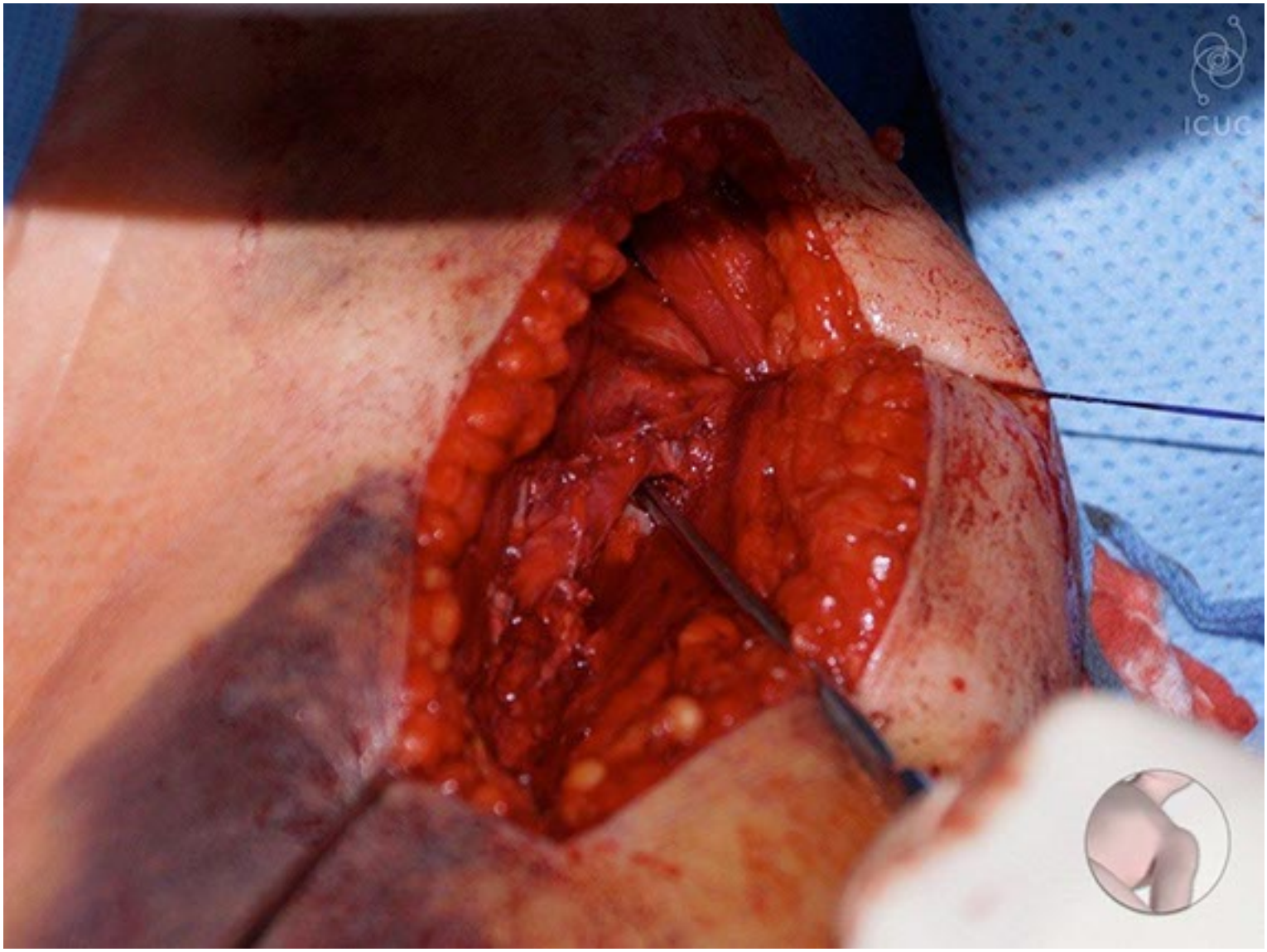



Now with the help of the raspatorium.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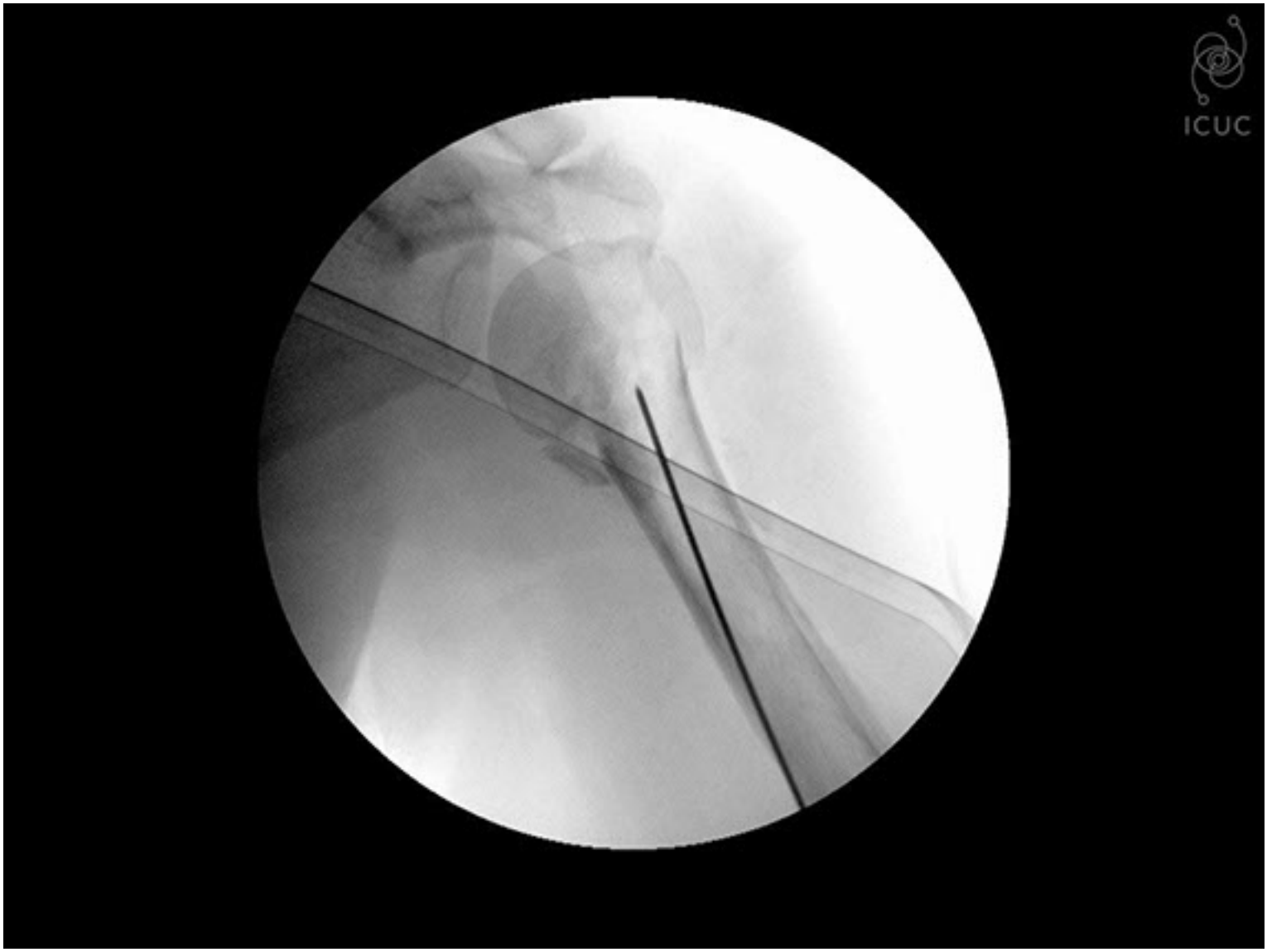
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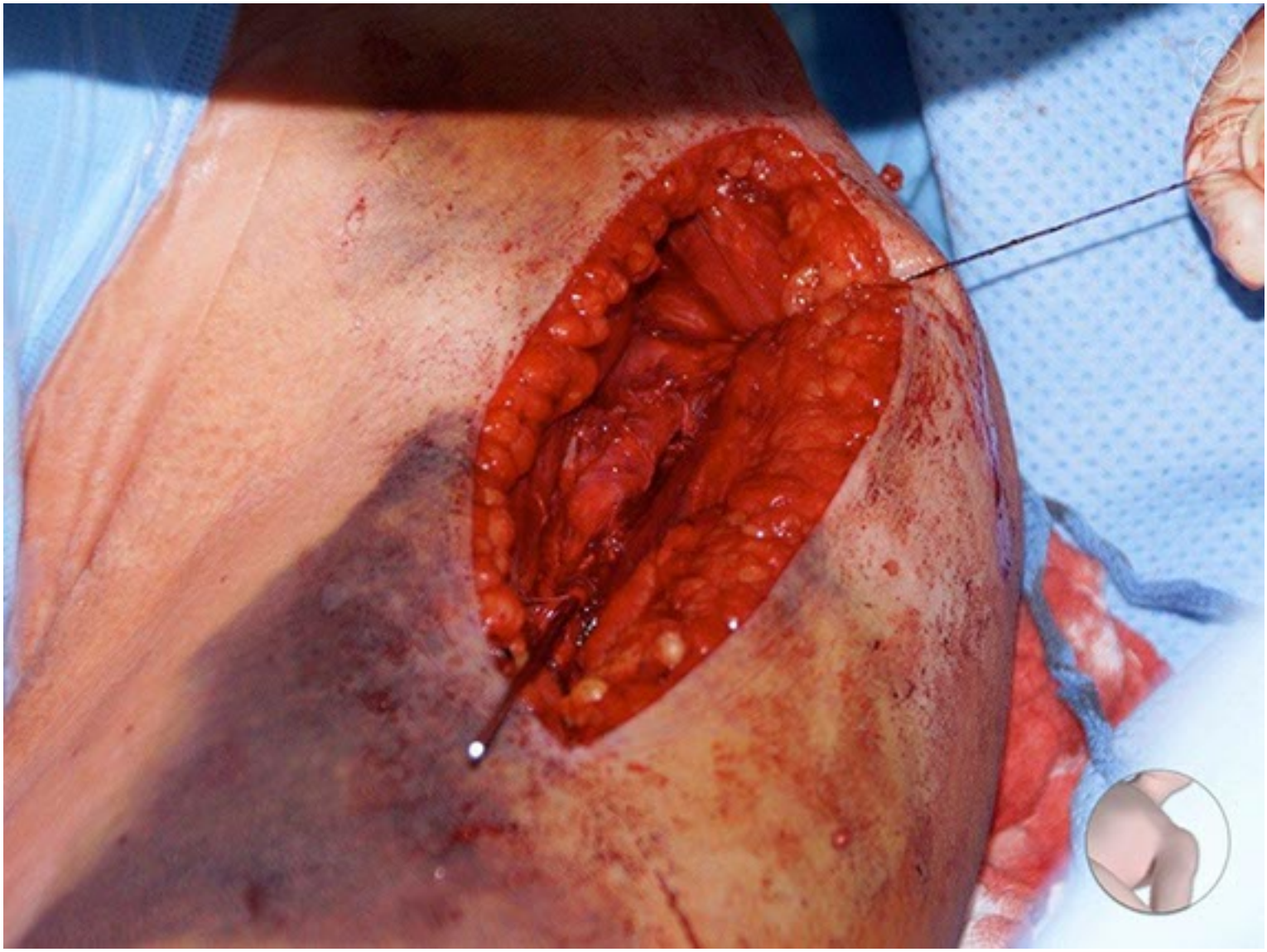

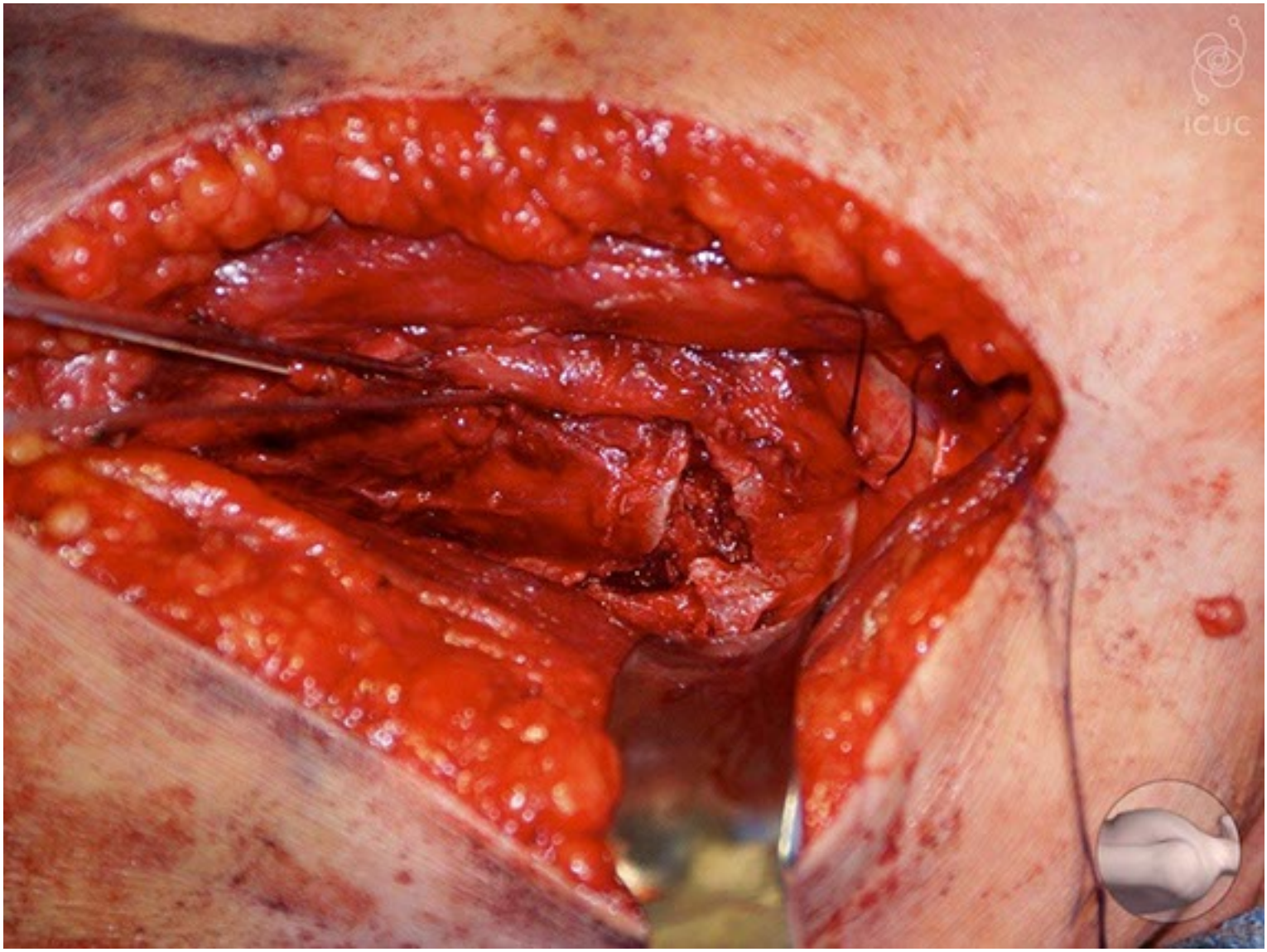

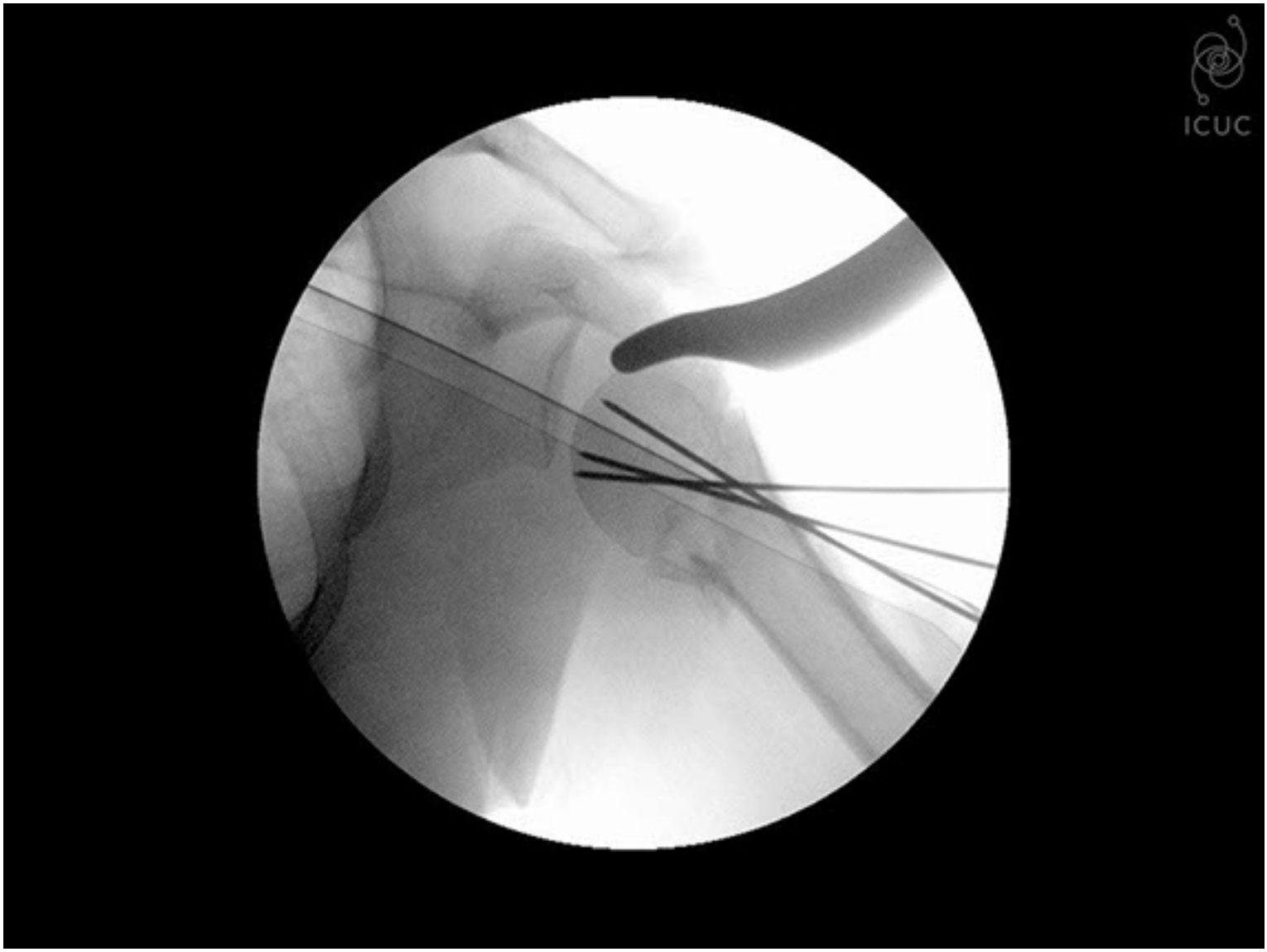
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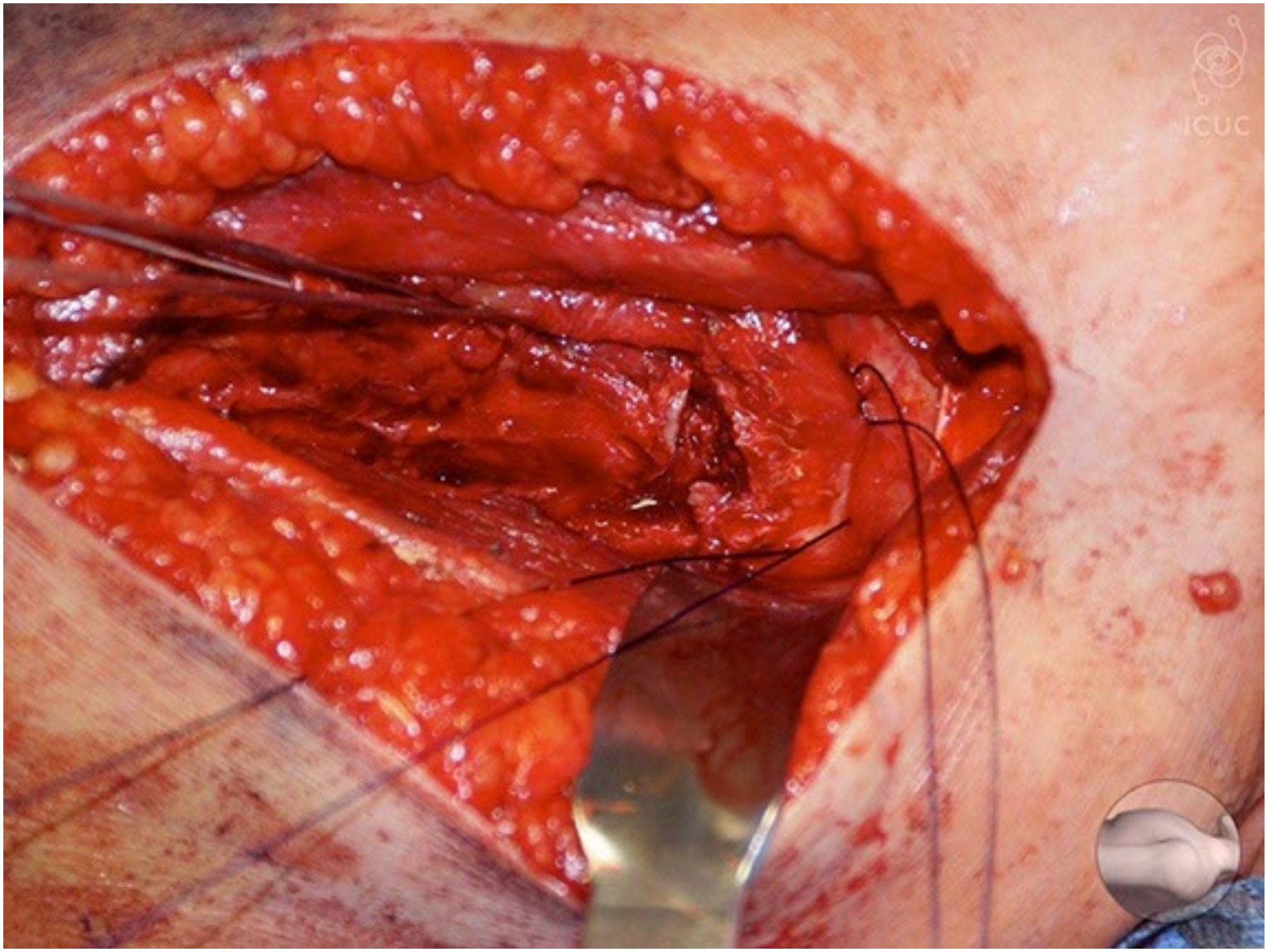

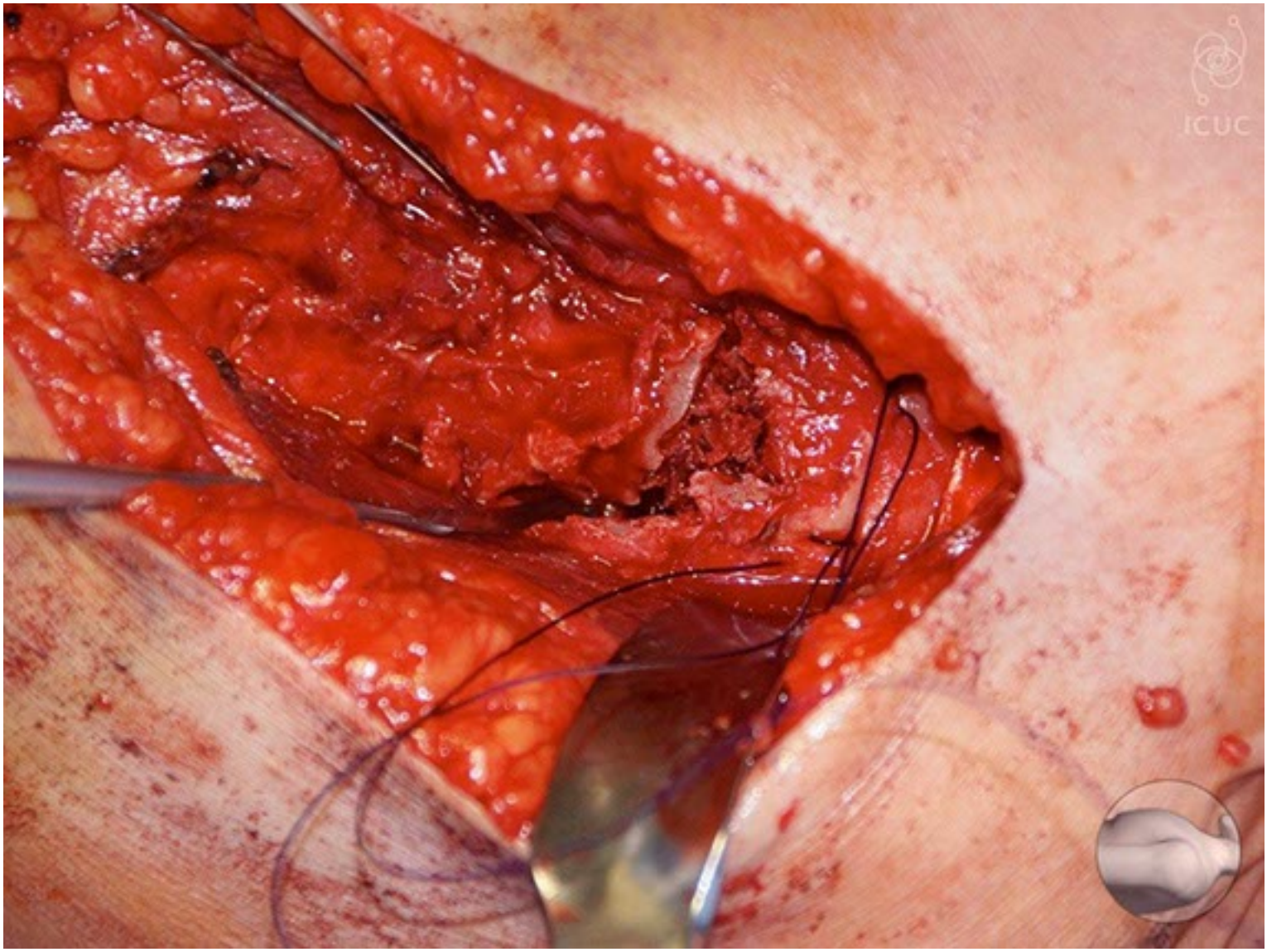

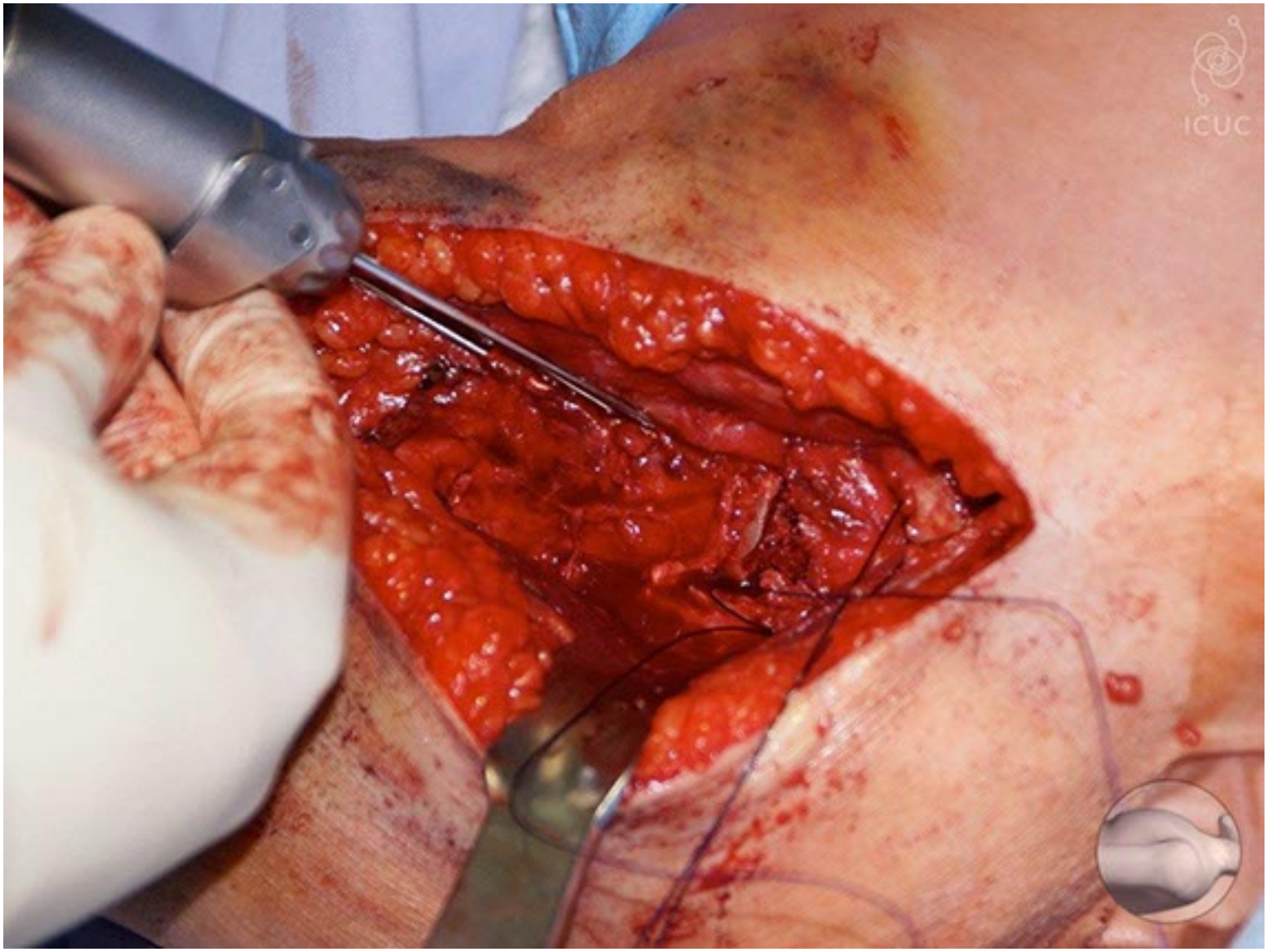
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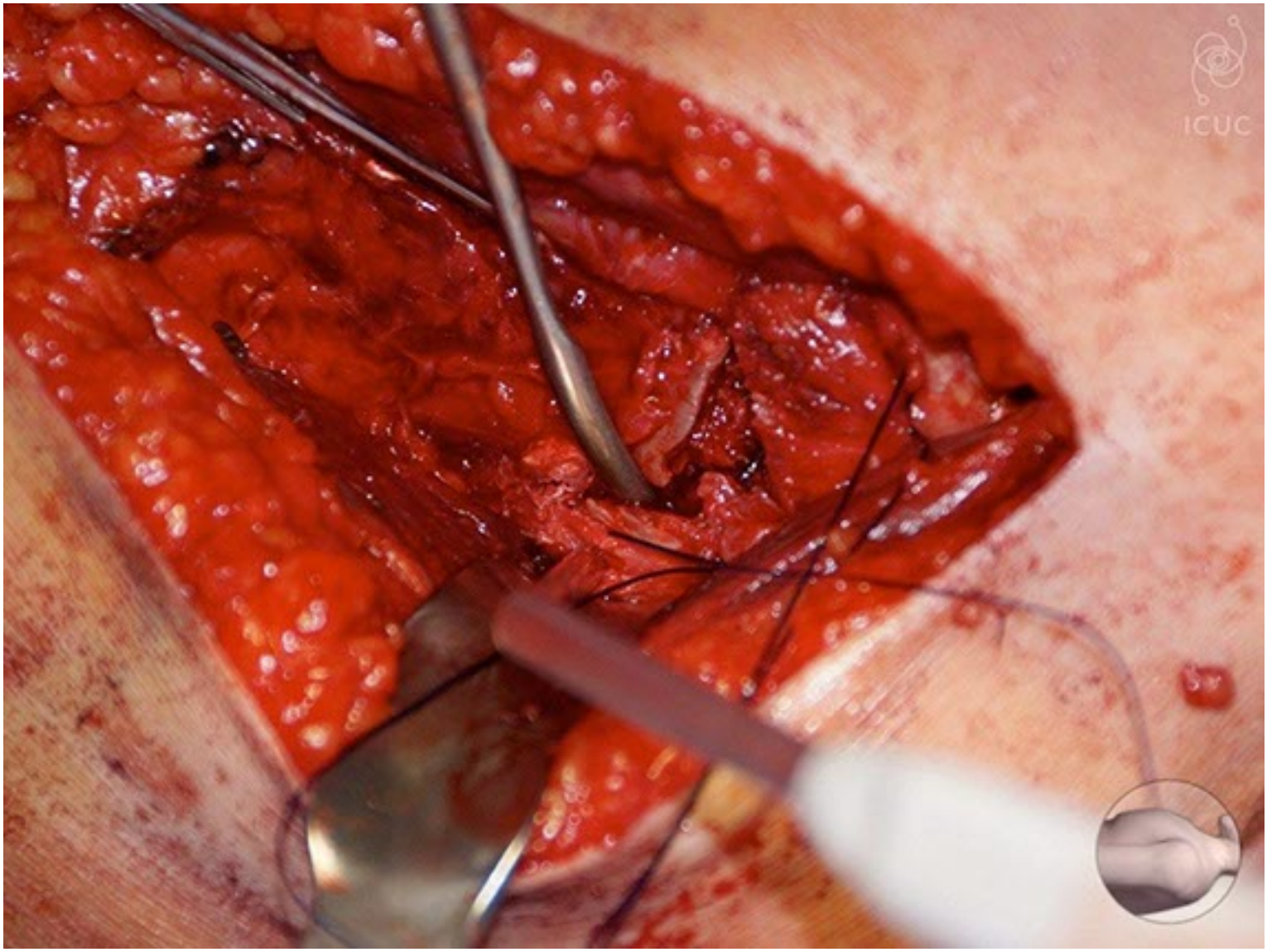
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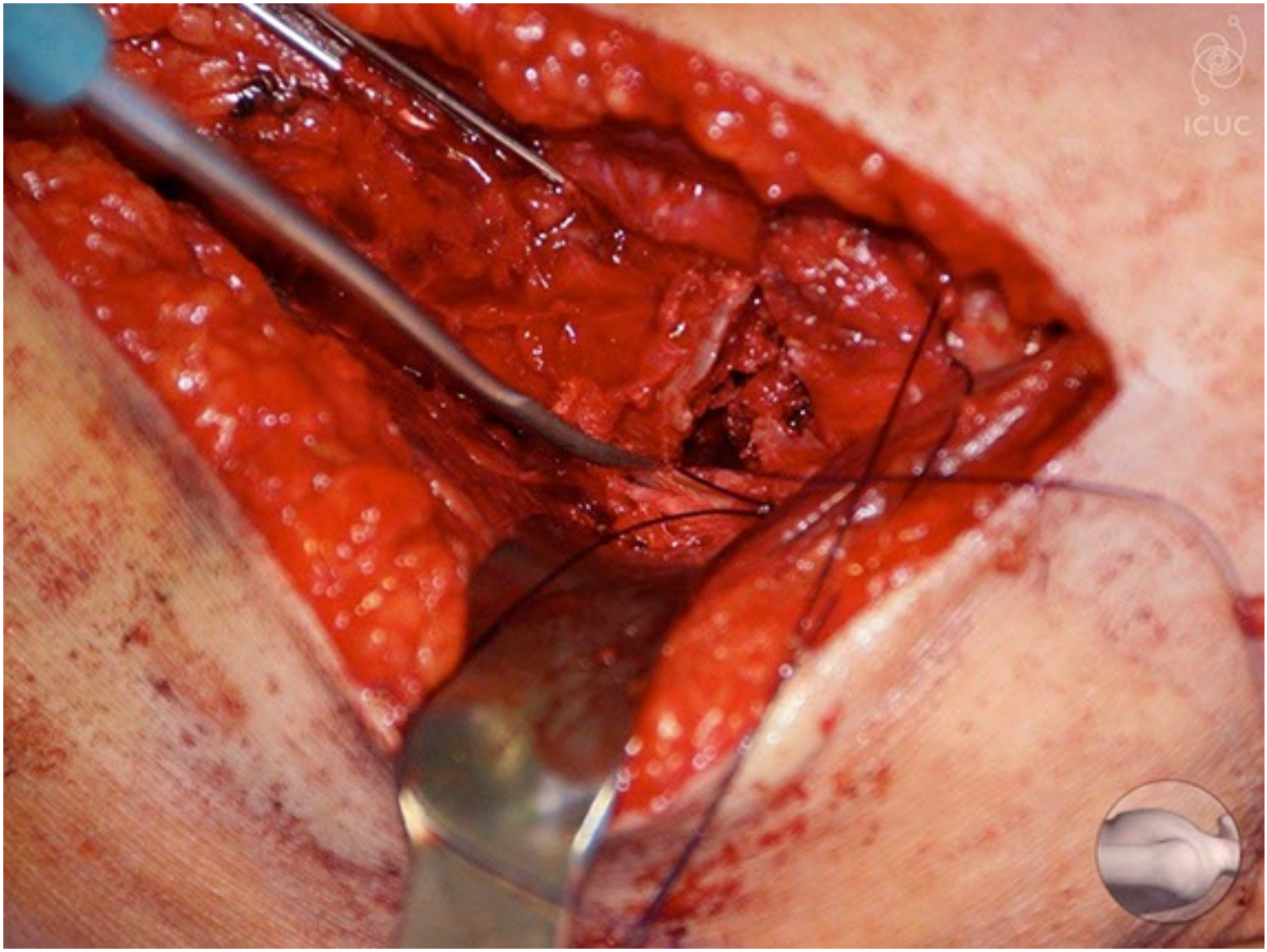
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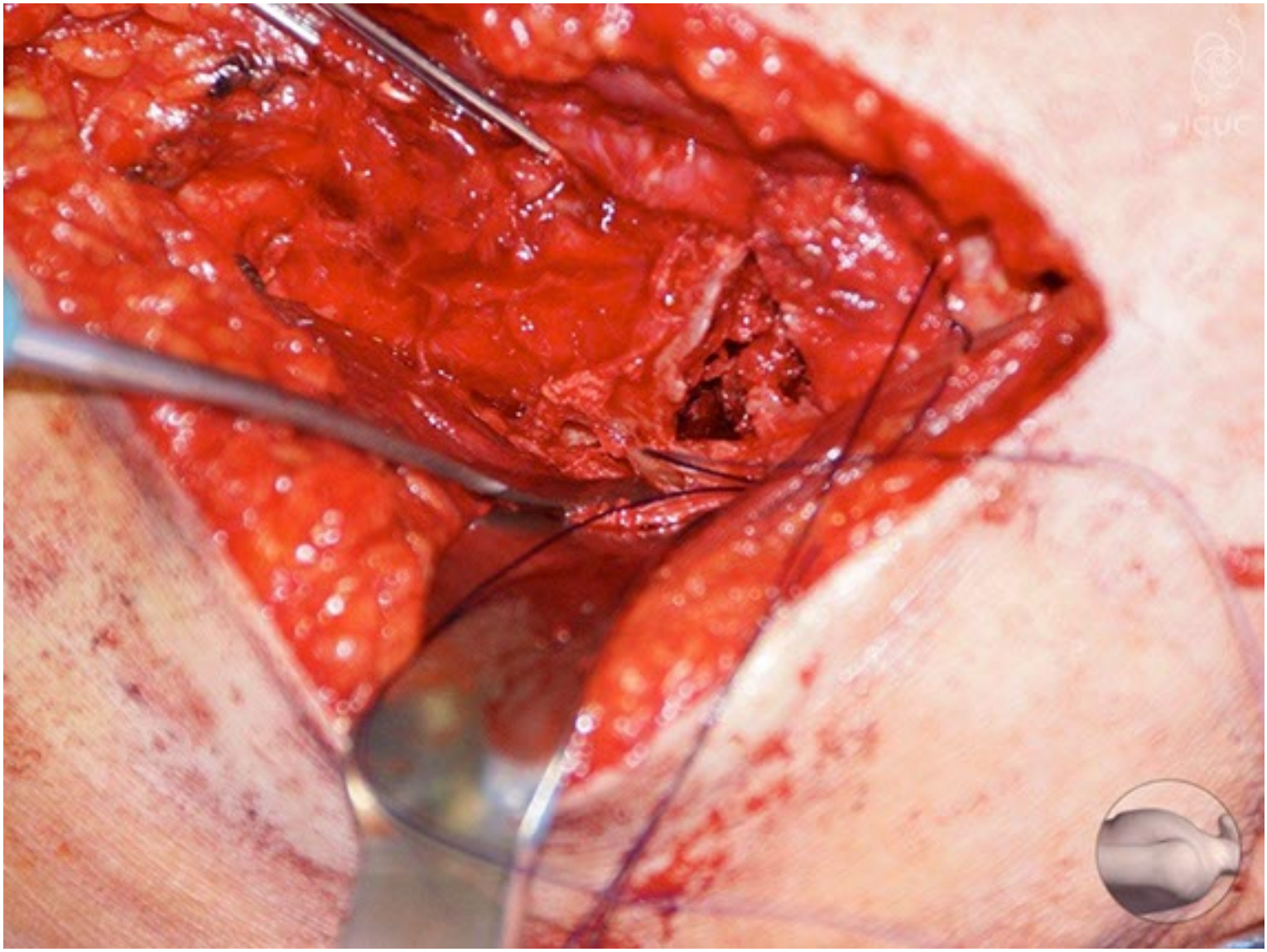

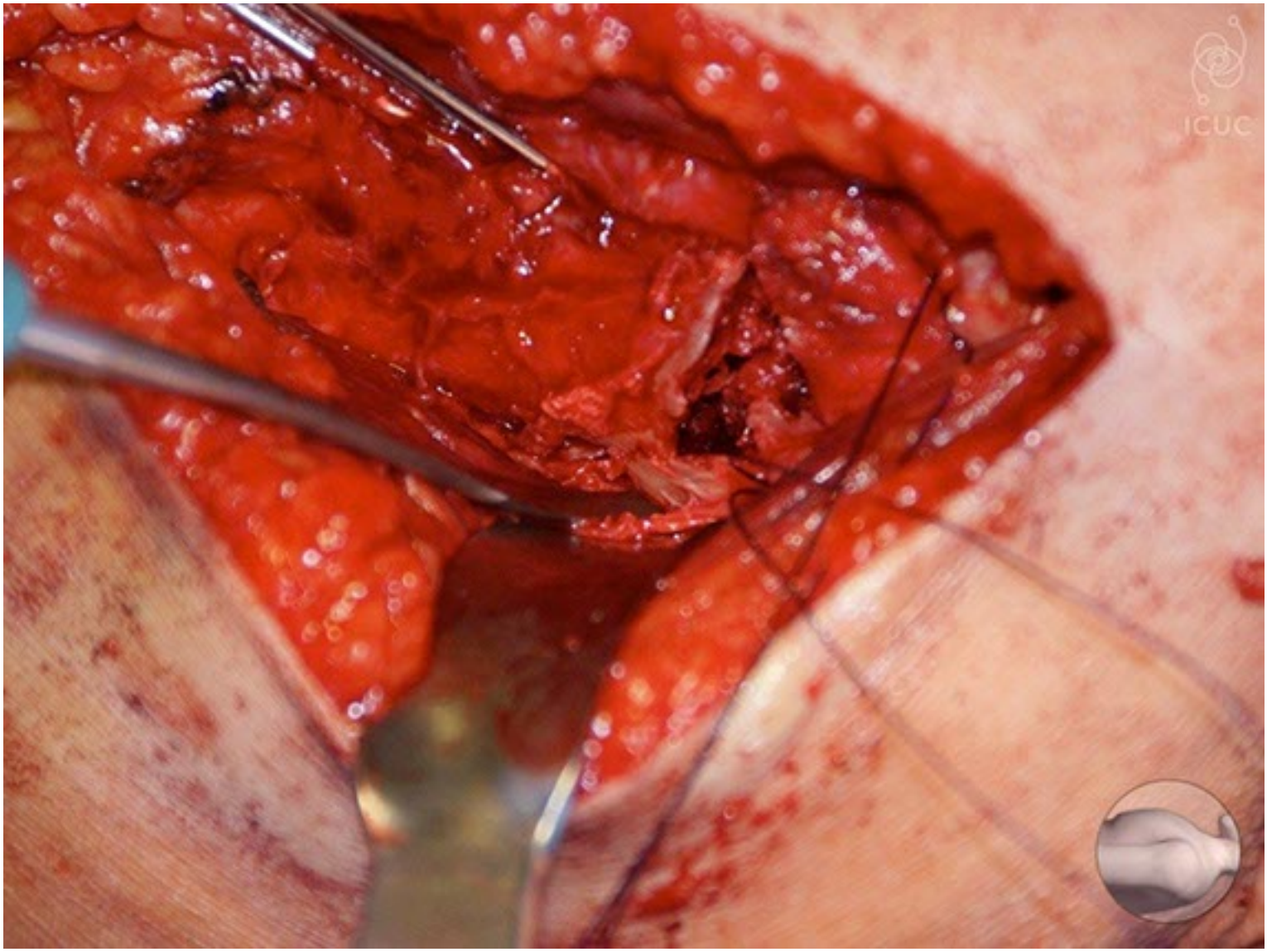

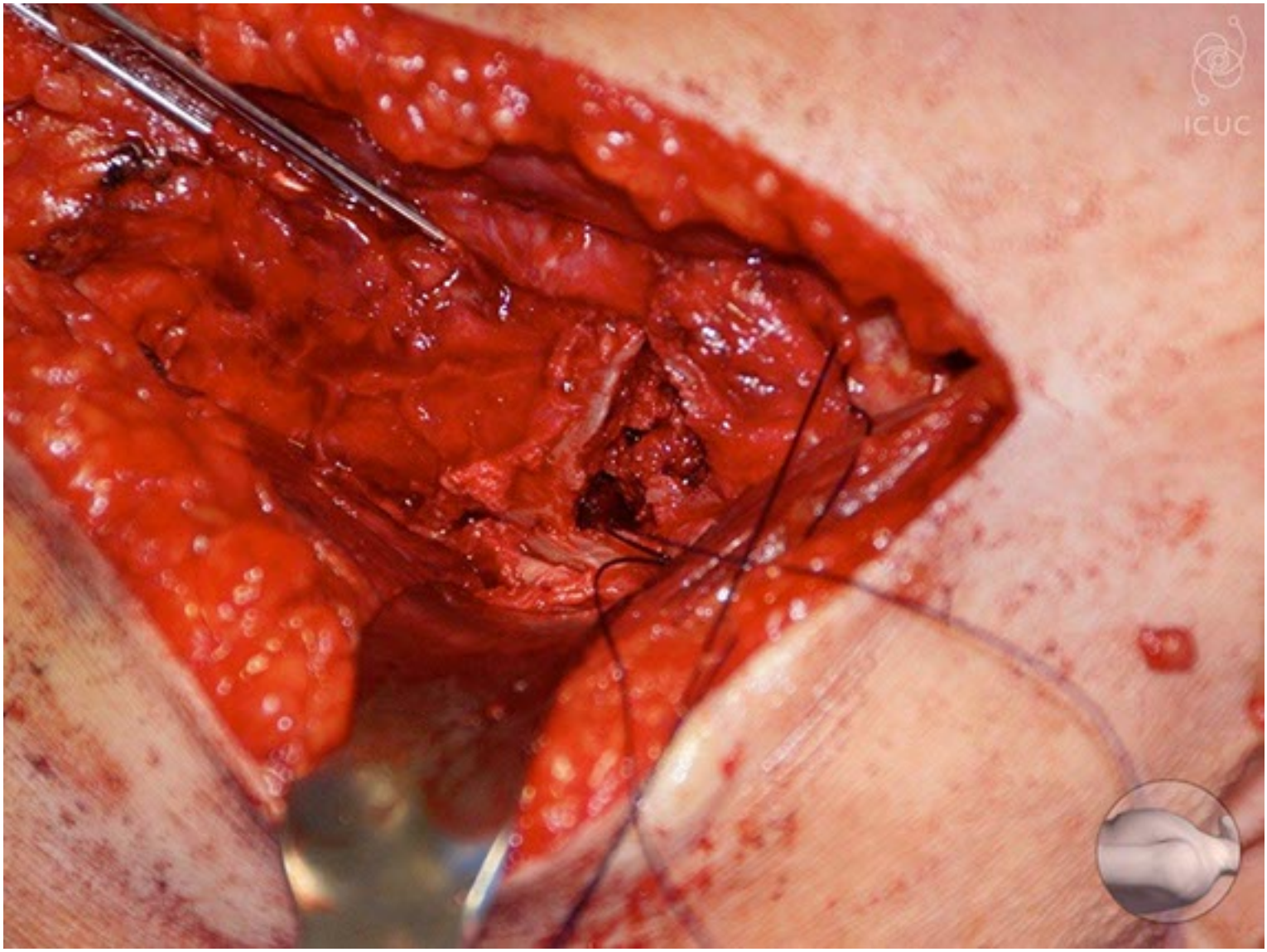
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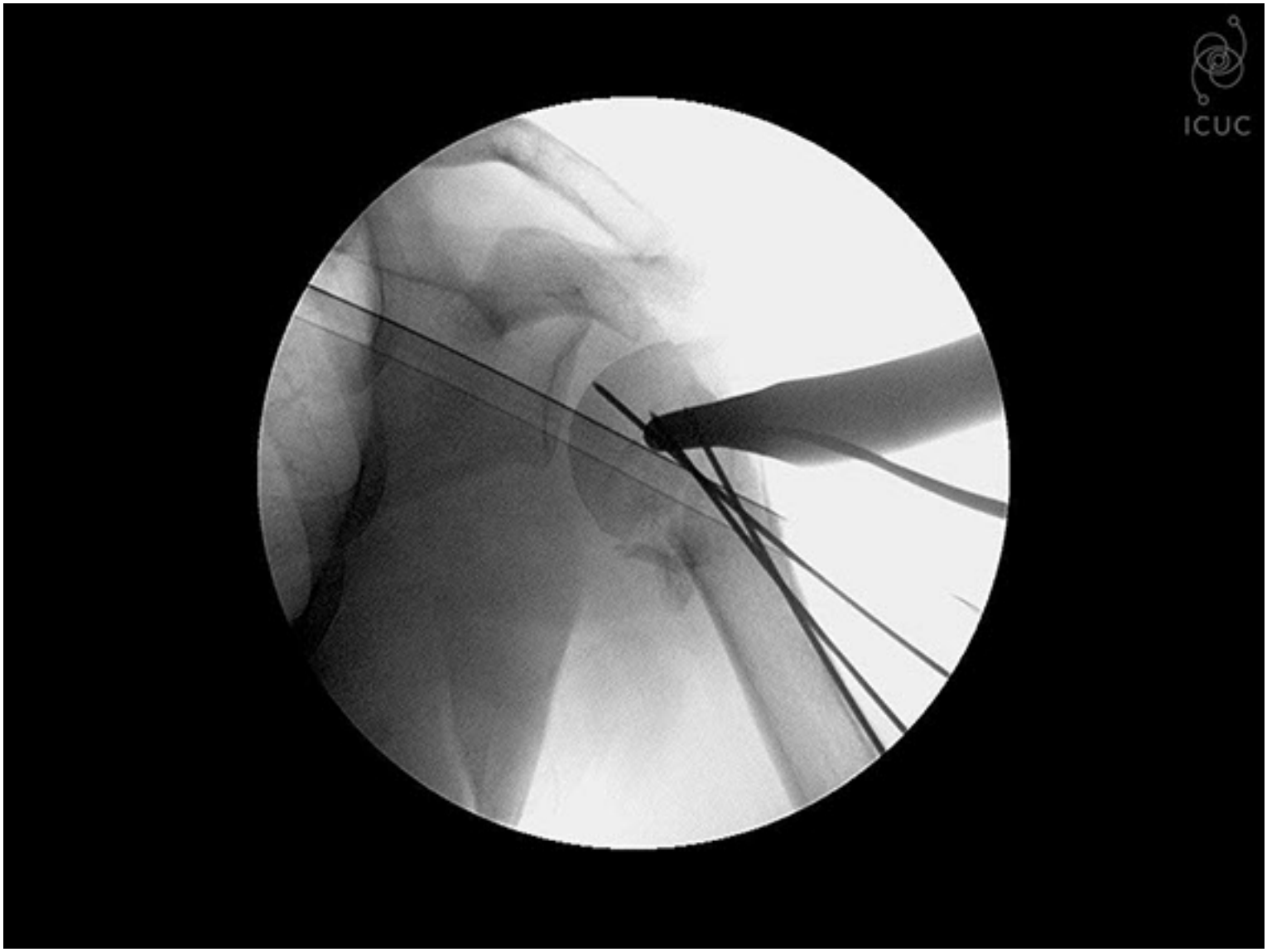
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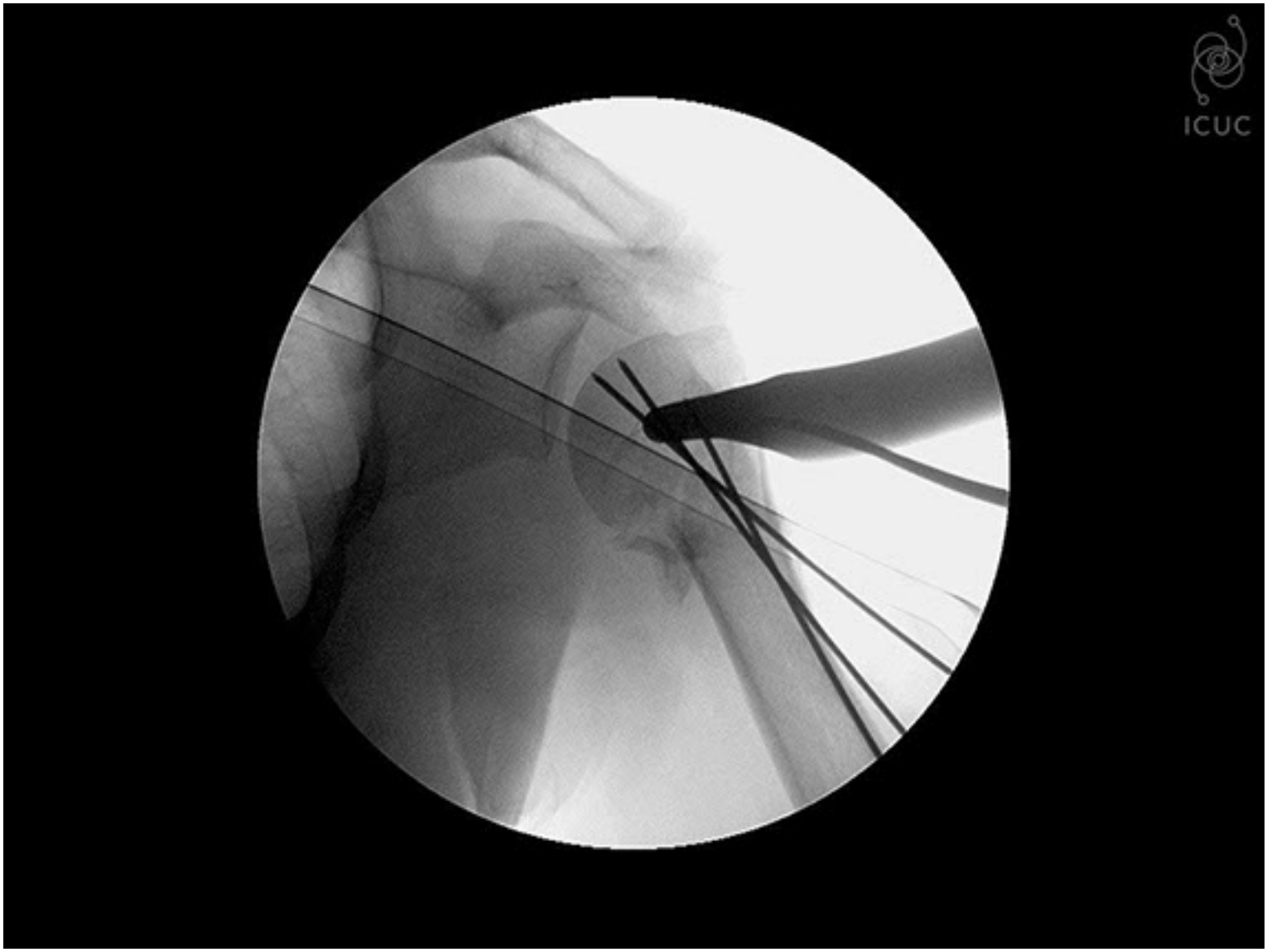
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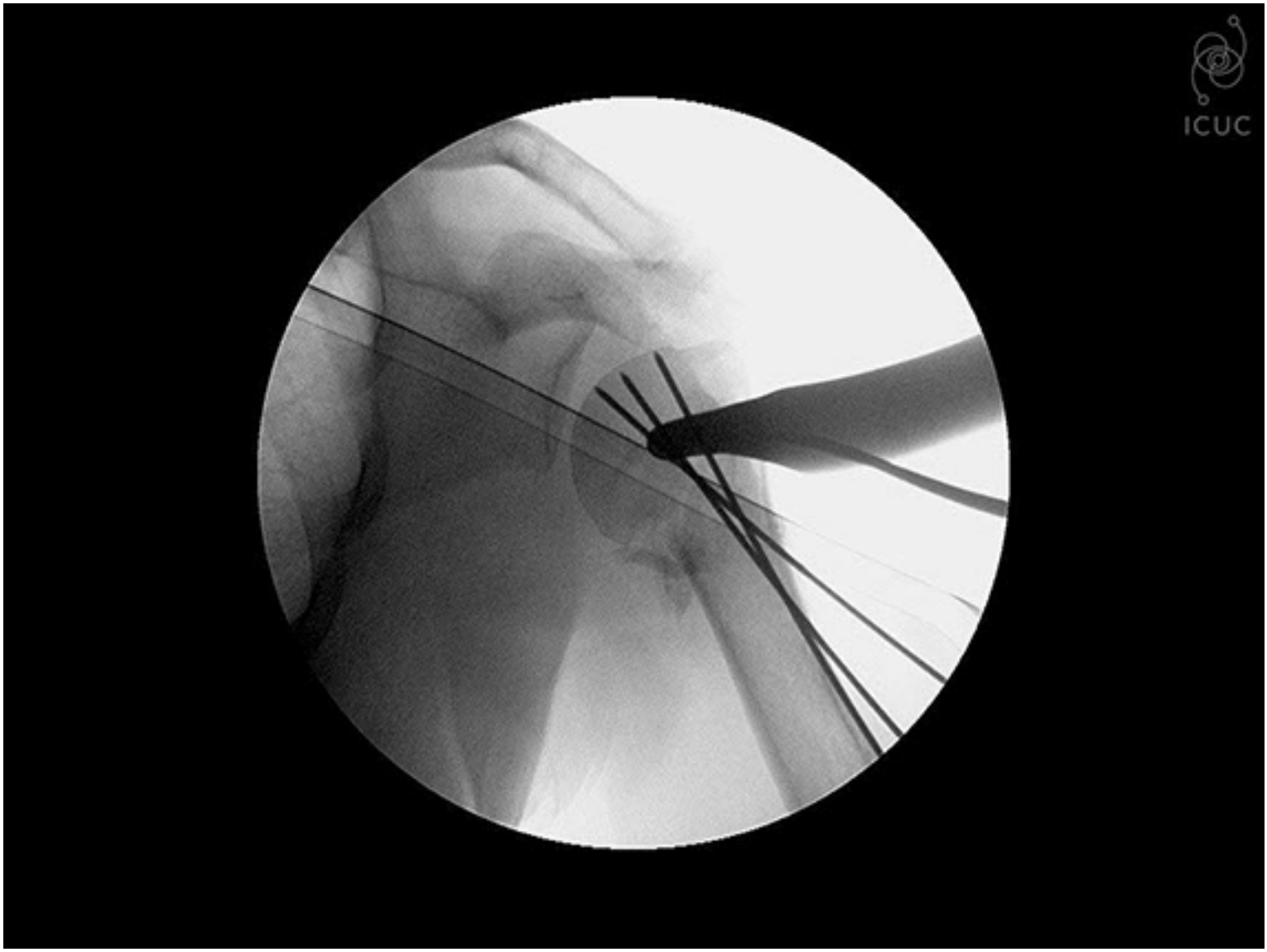
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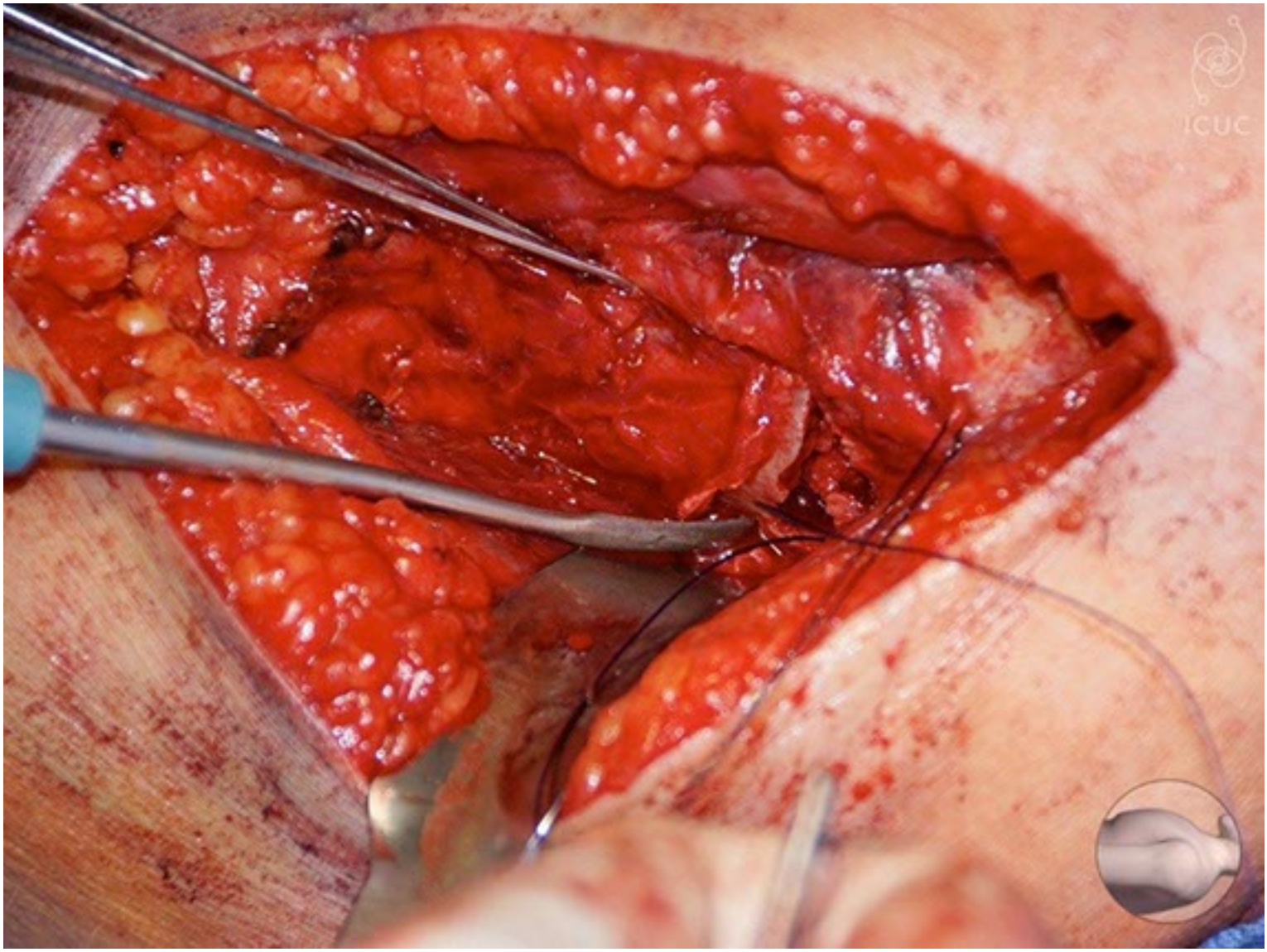
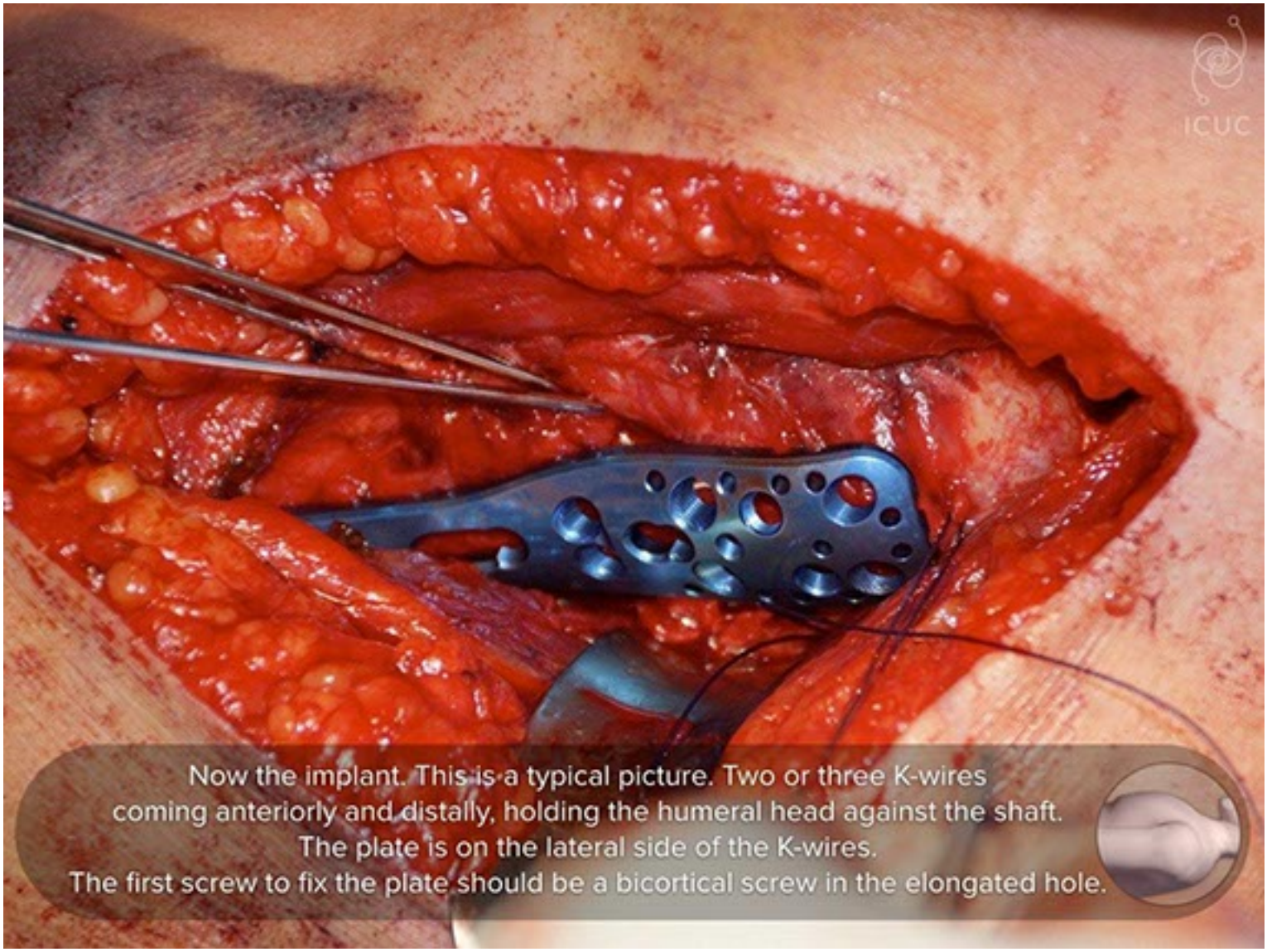
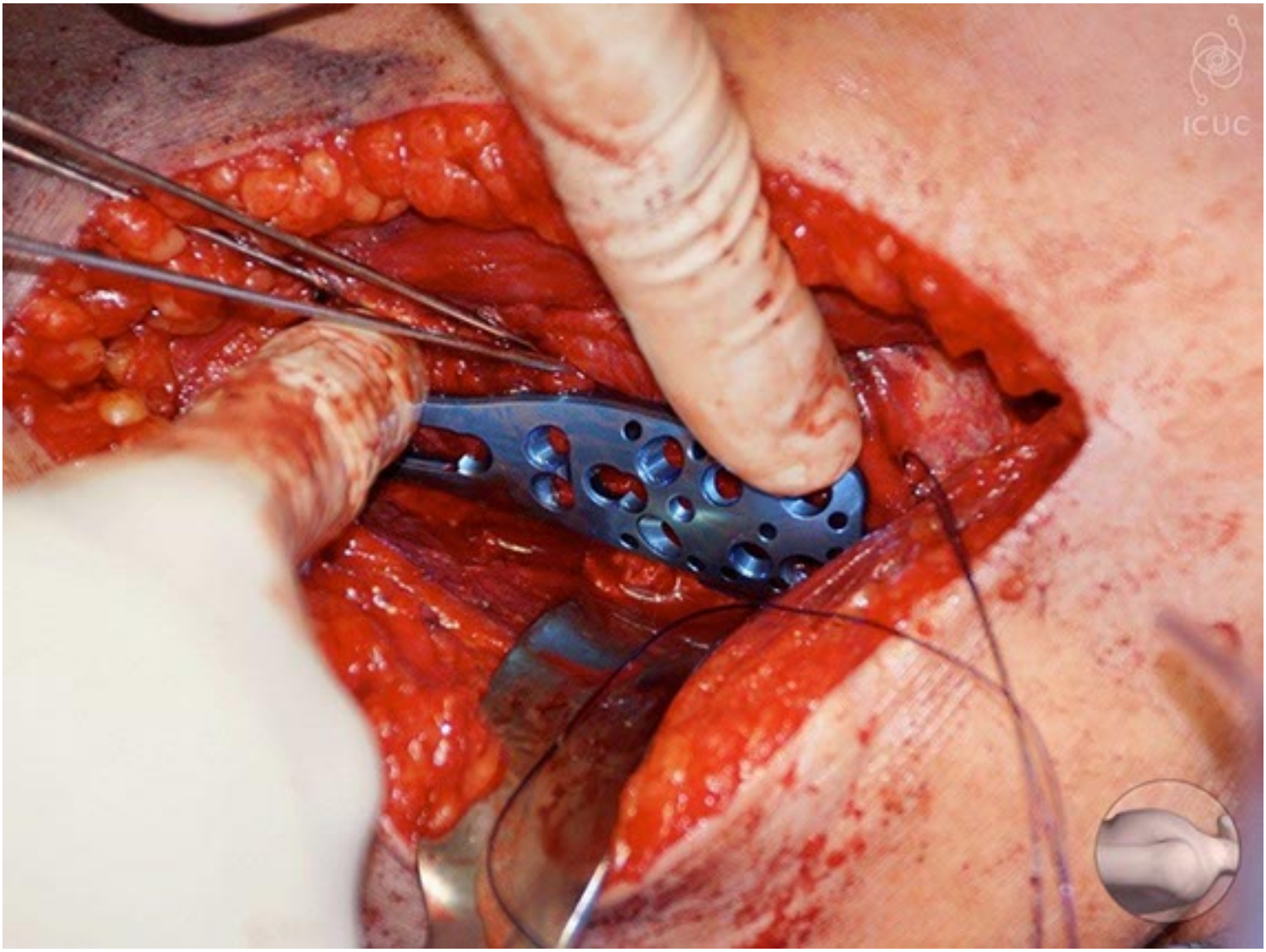
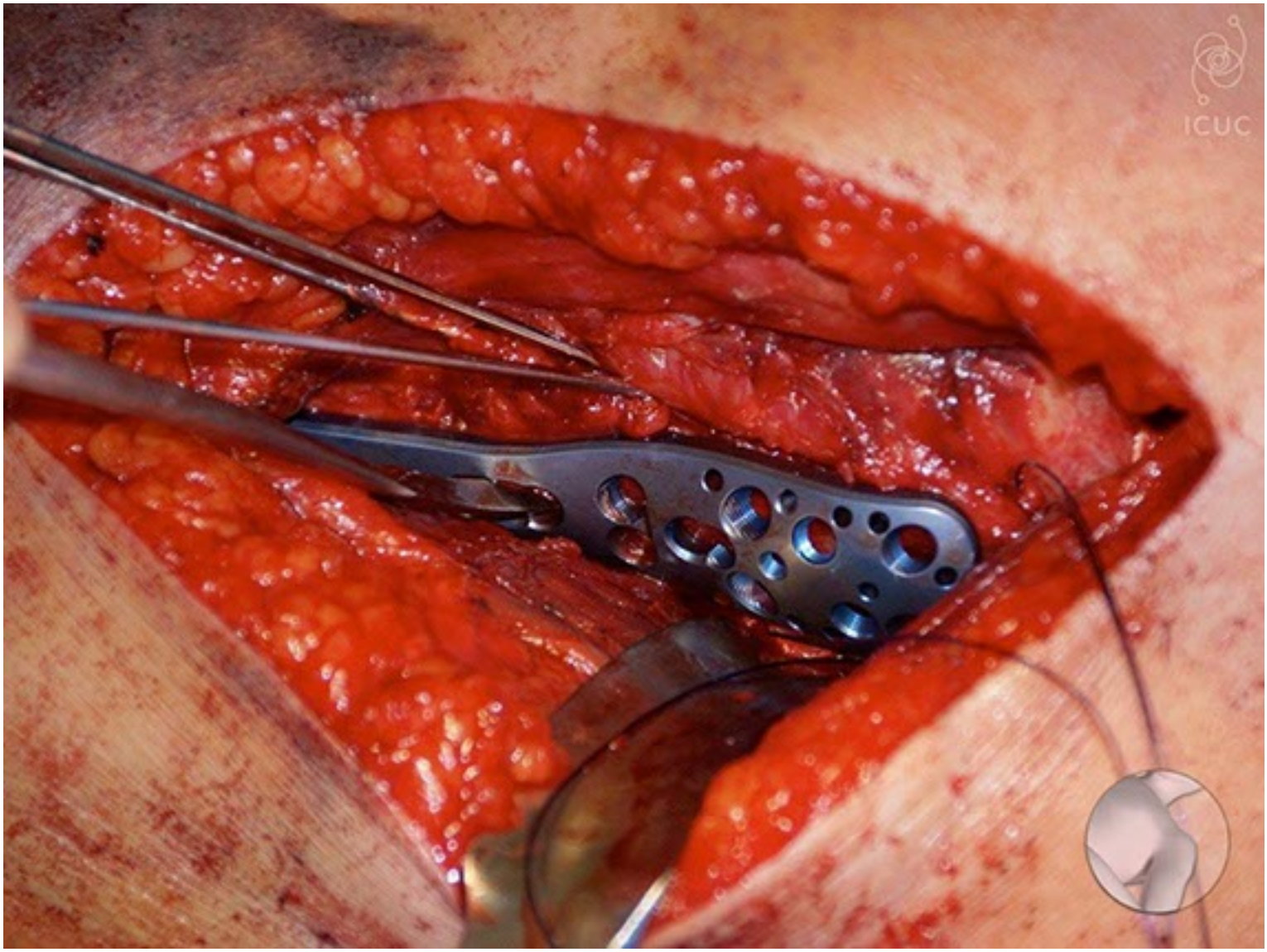



ICUC
Now the implant. This is a typical picture. Two or three K-wires
coming anteriorly and distally, holding the humeral head against the shaft.
The plate is on the lateral side of the K-wires.
The first screw to fix the plate should be a bicortical screw in the elongated hole.


ICUC


ICUC
This is checked under fluoroscopy.
There is medial comminution although it has not spread too much
so this will probably heal. Varus displacement is no longer observed.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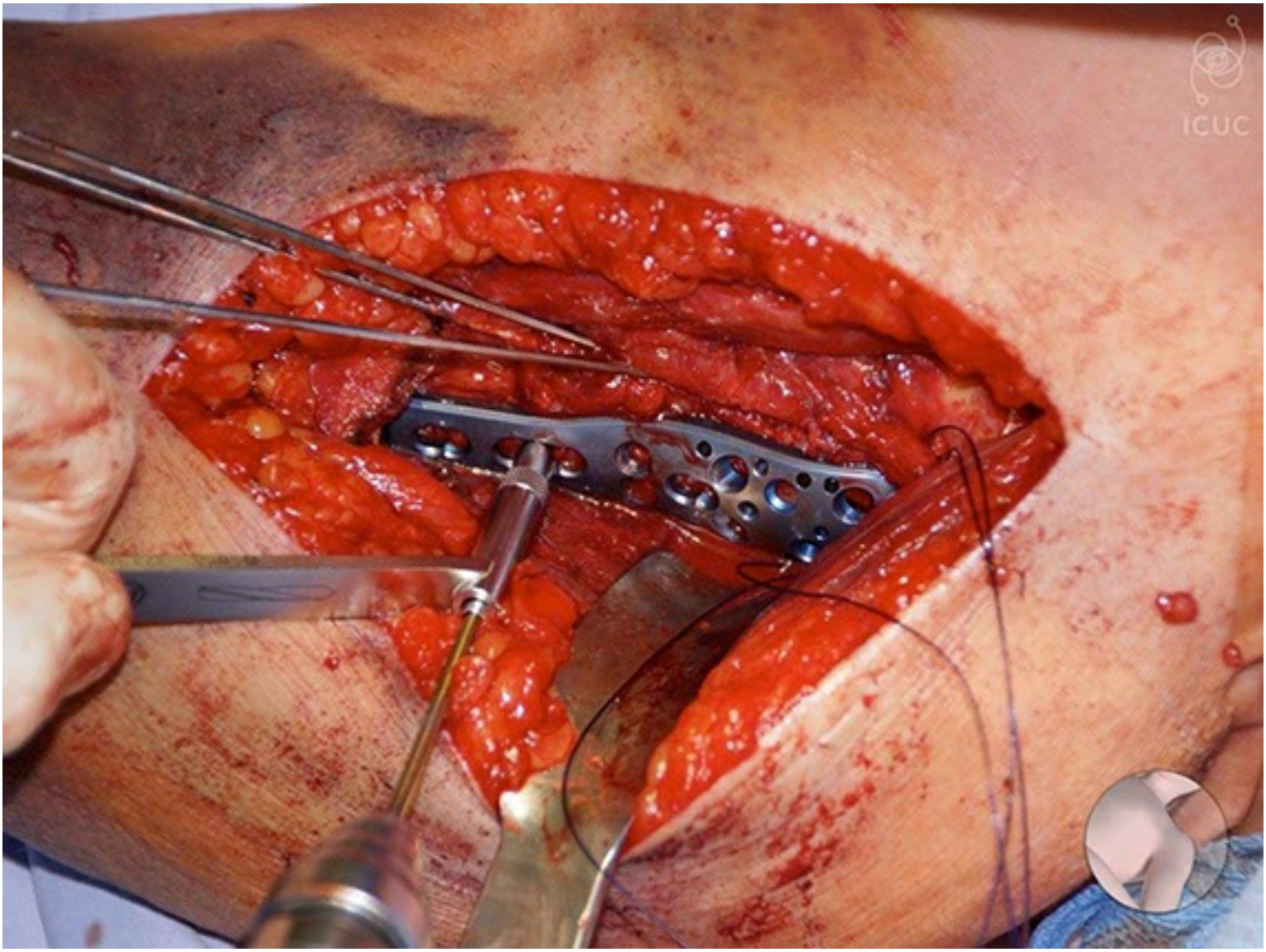
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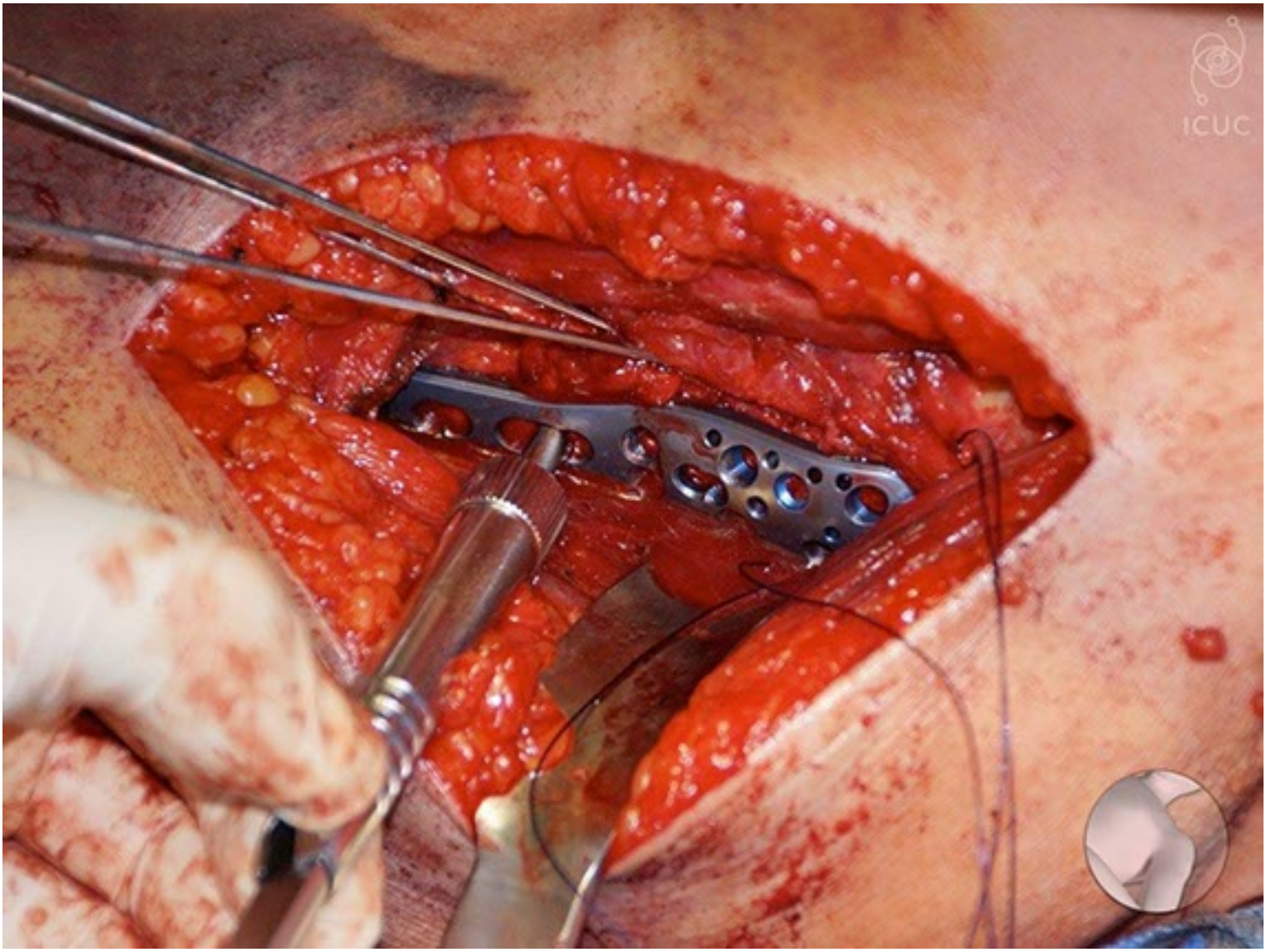
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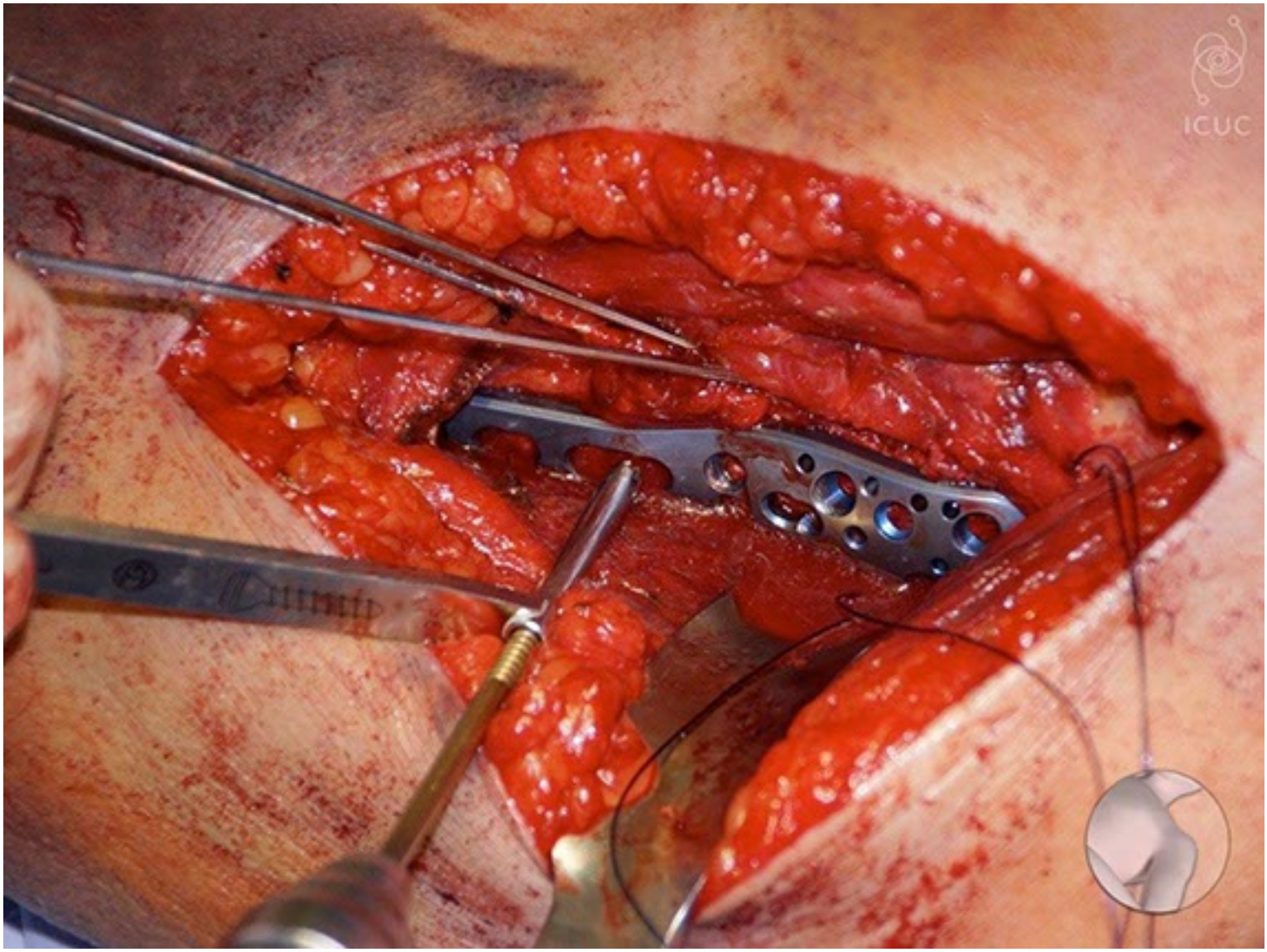
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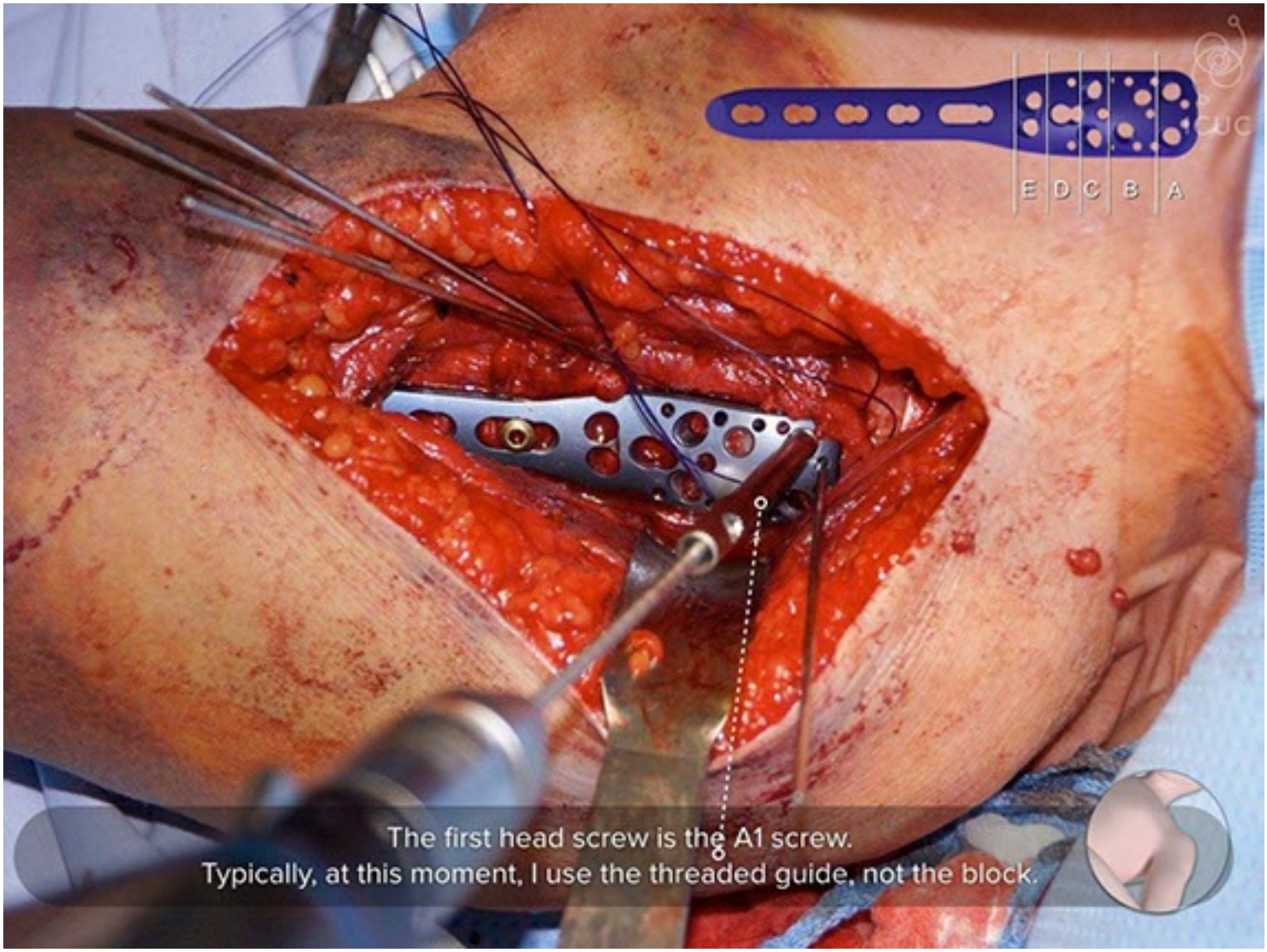
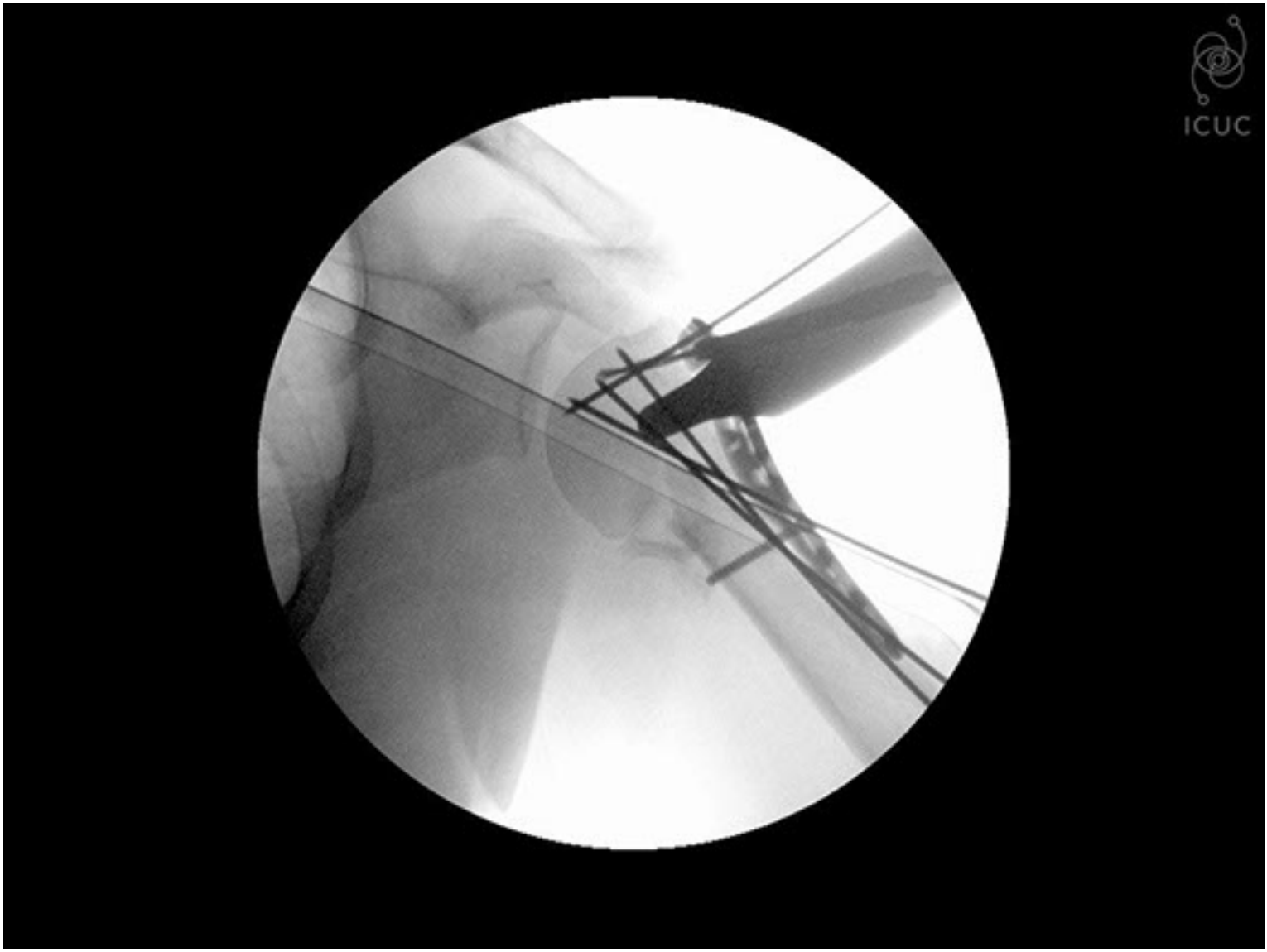

E D C B A
The first head screw is the A1 screw.
Typically, at this moment, I use the threaded guide, not the block.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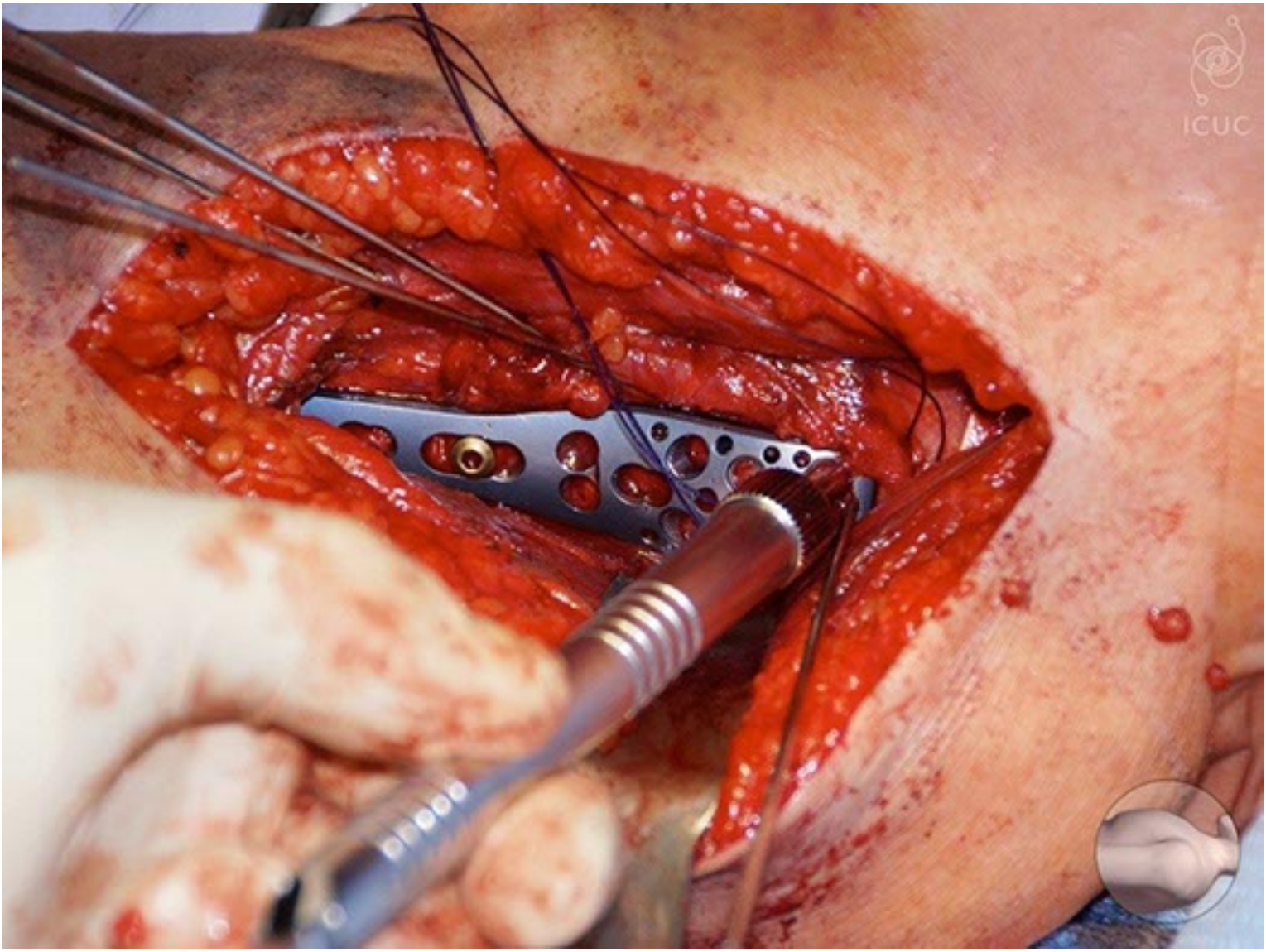
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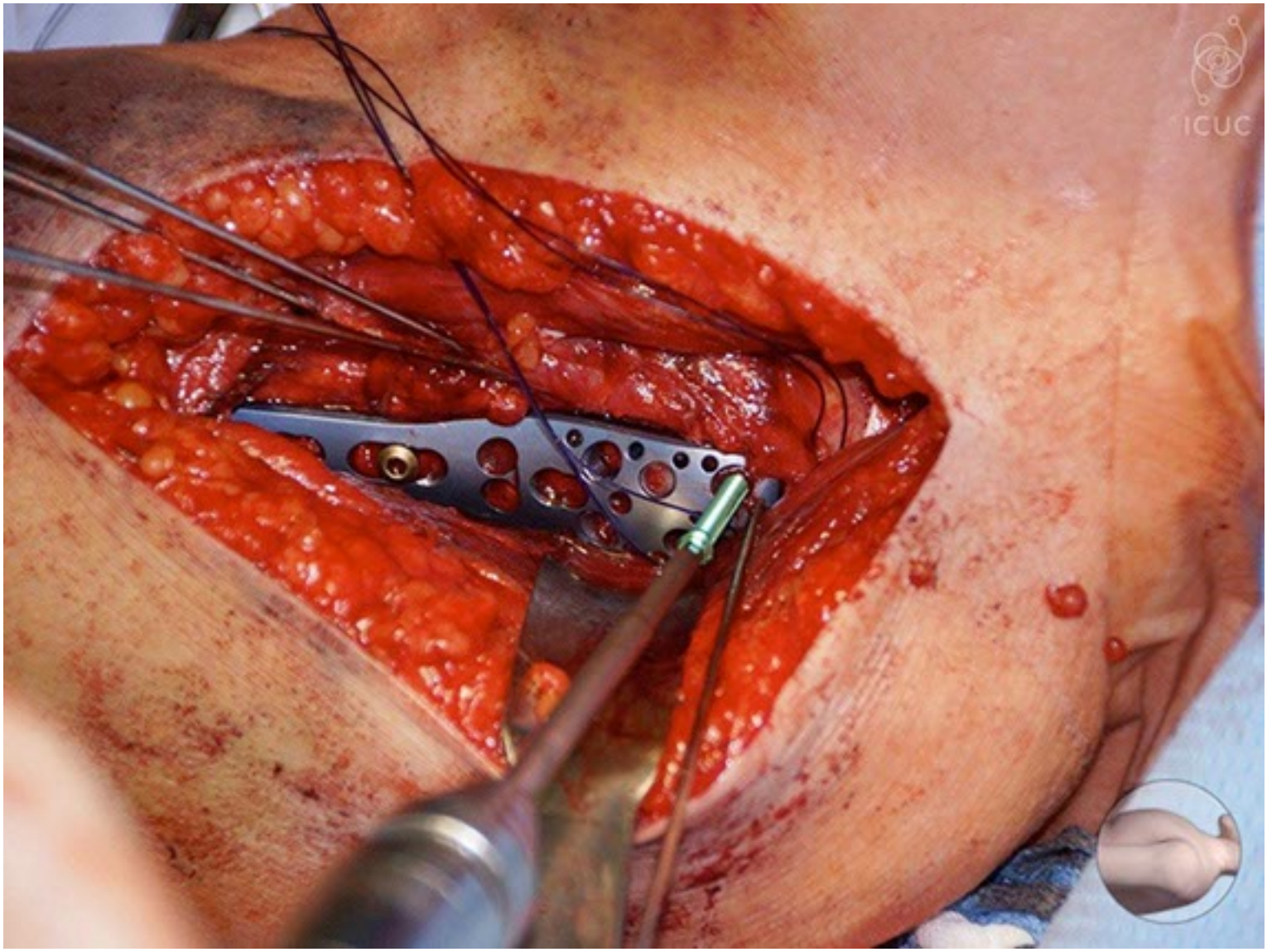

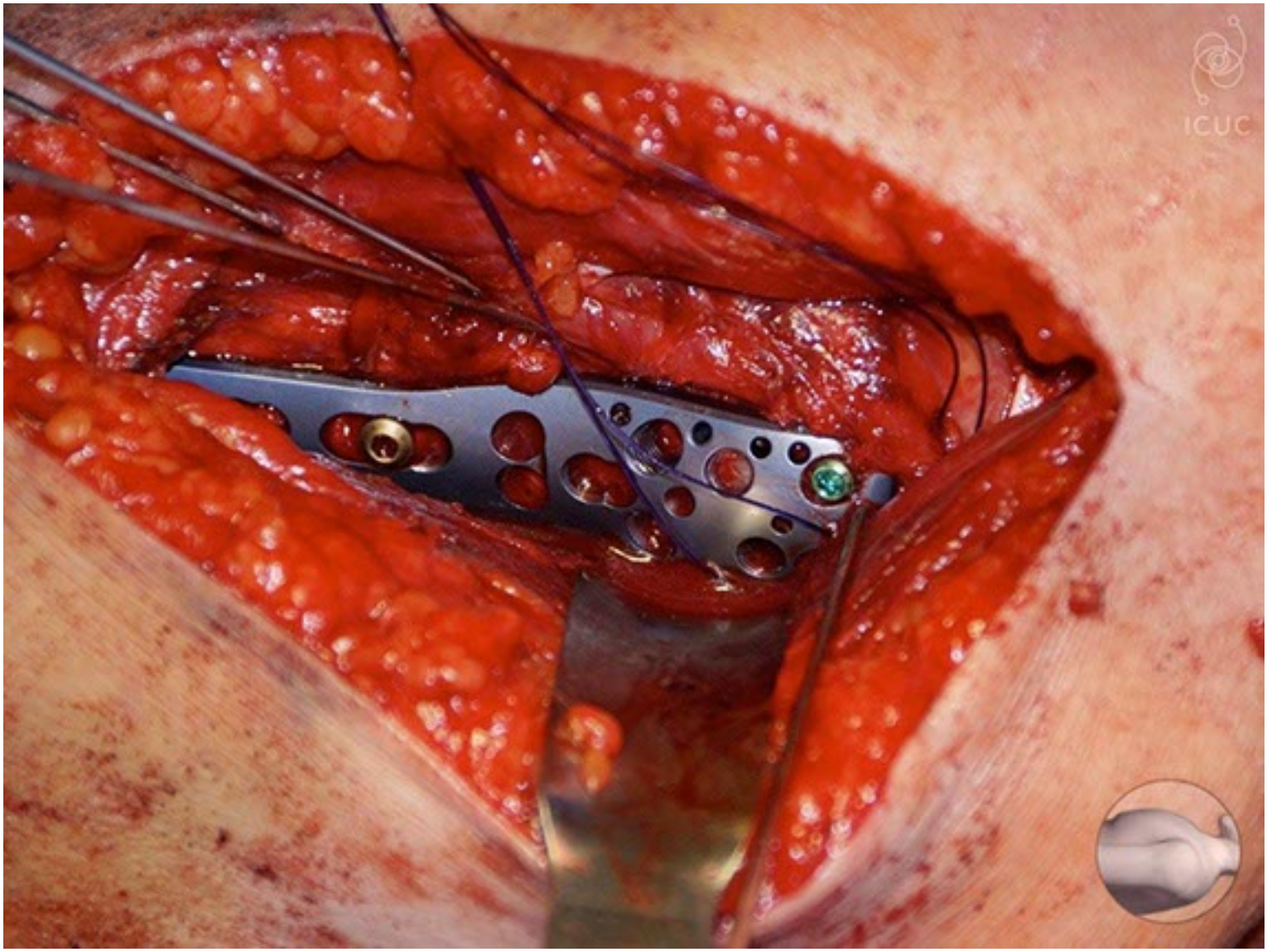
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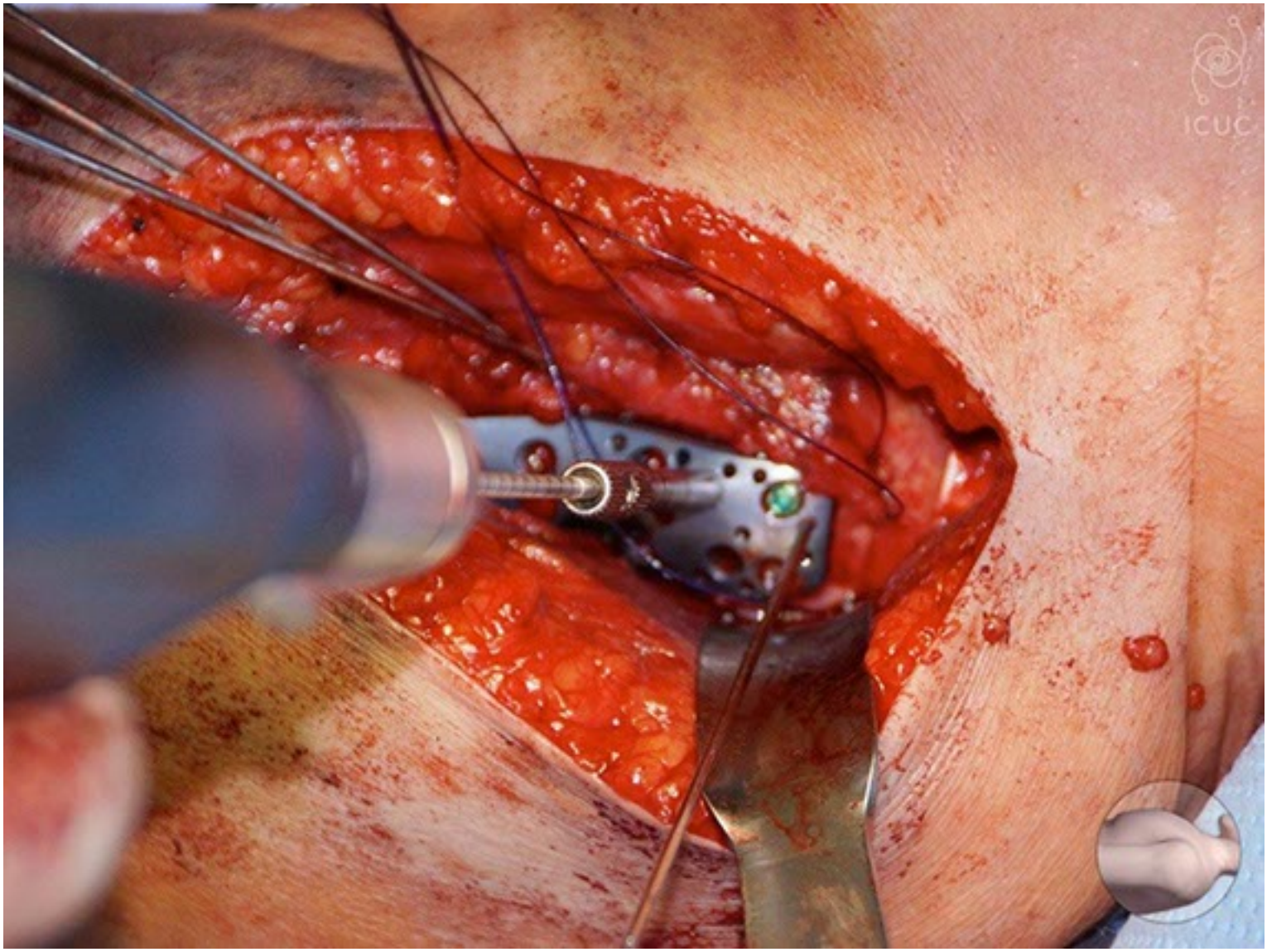

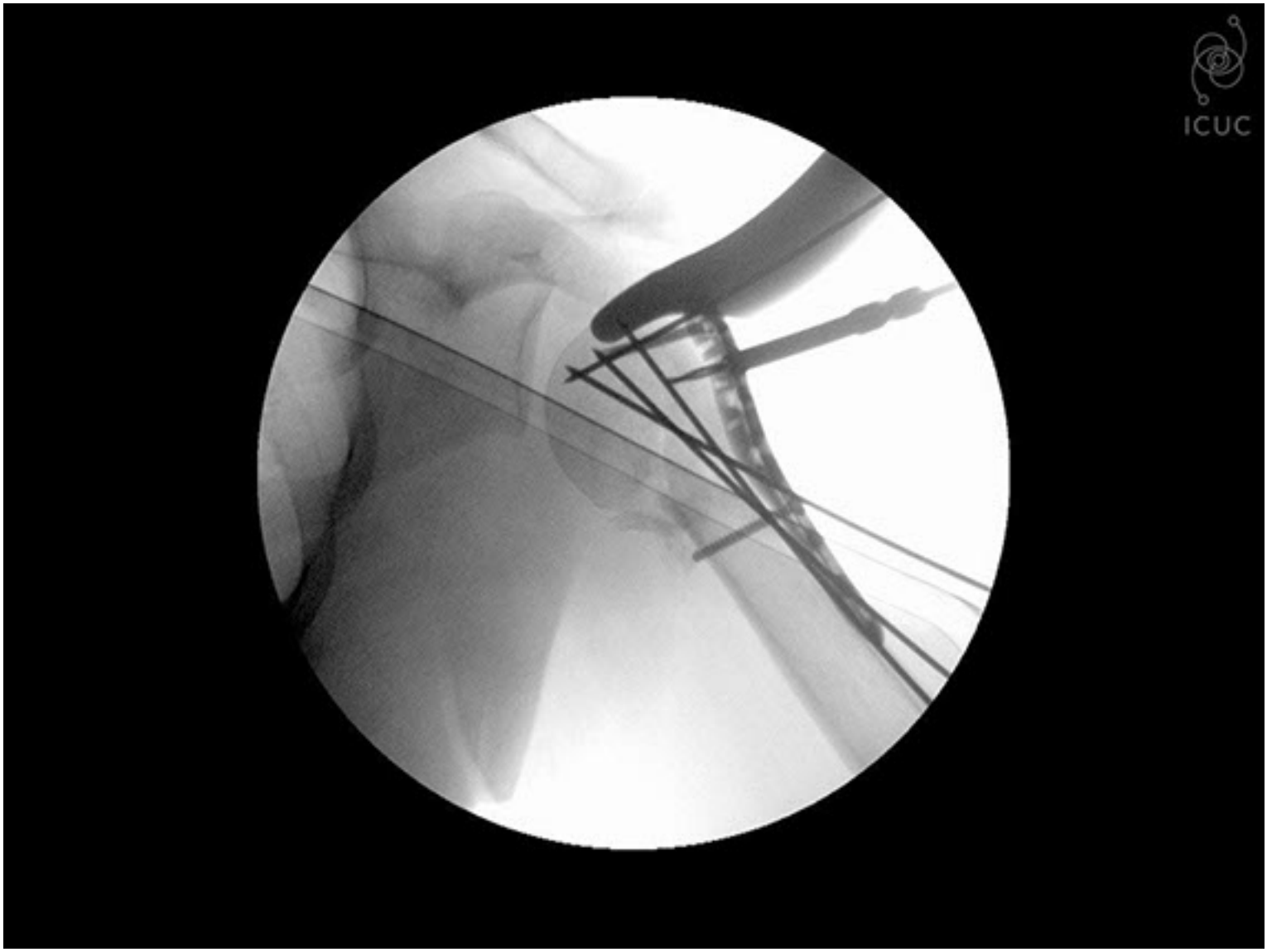
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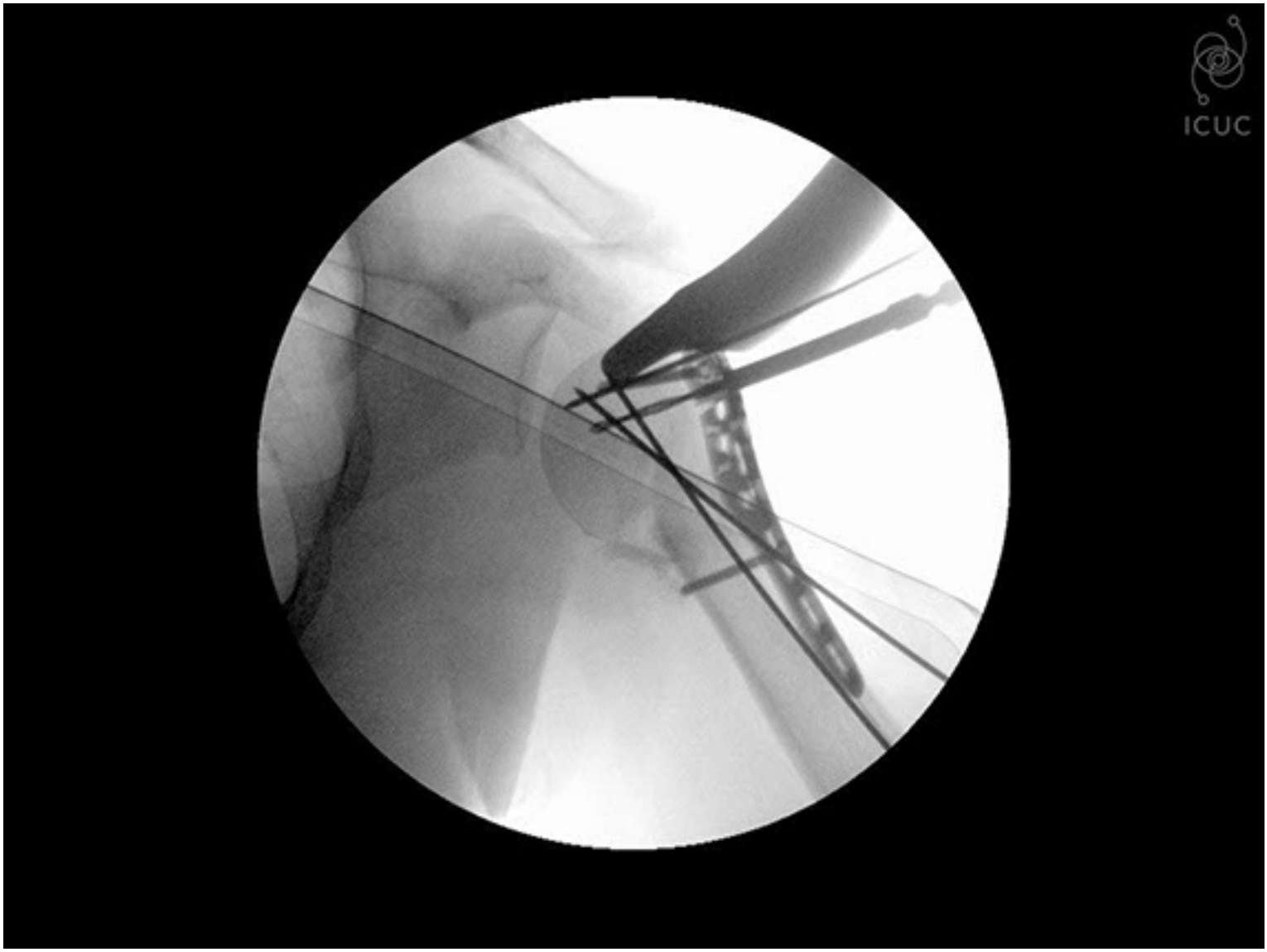
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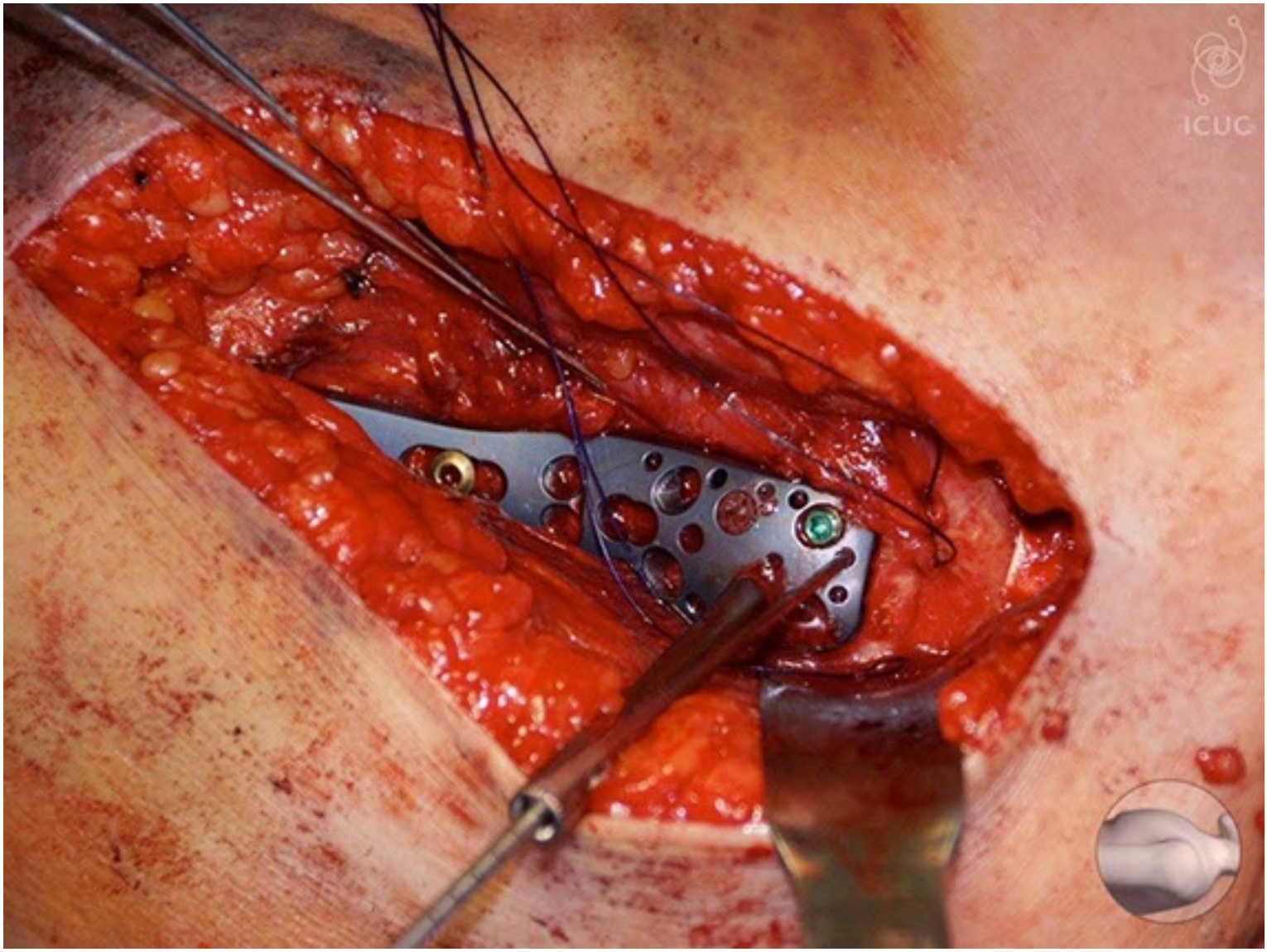
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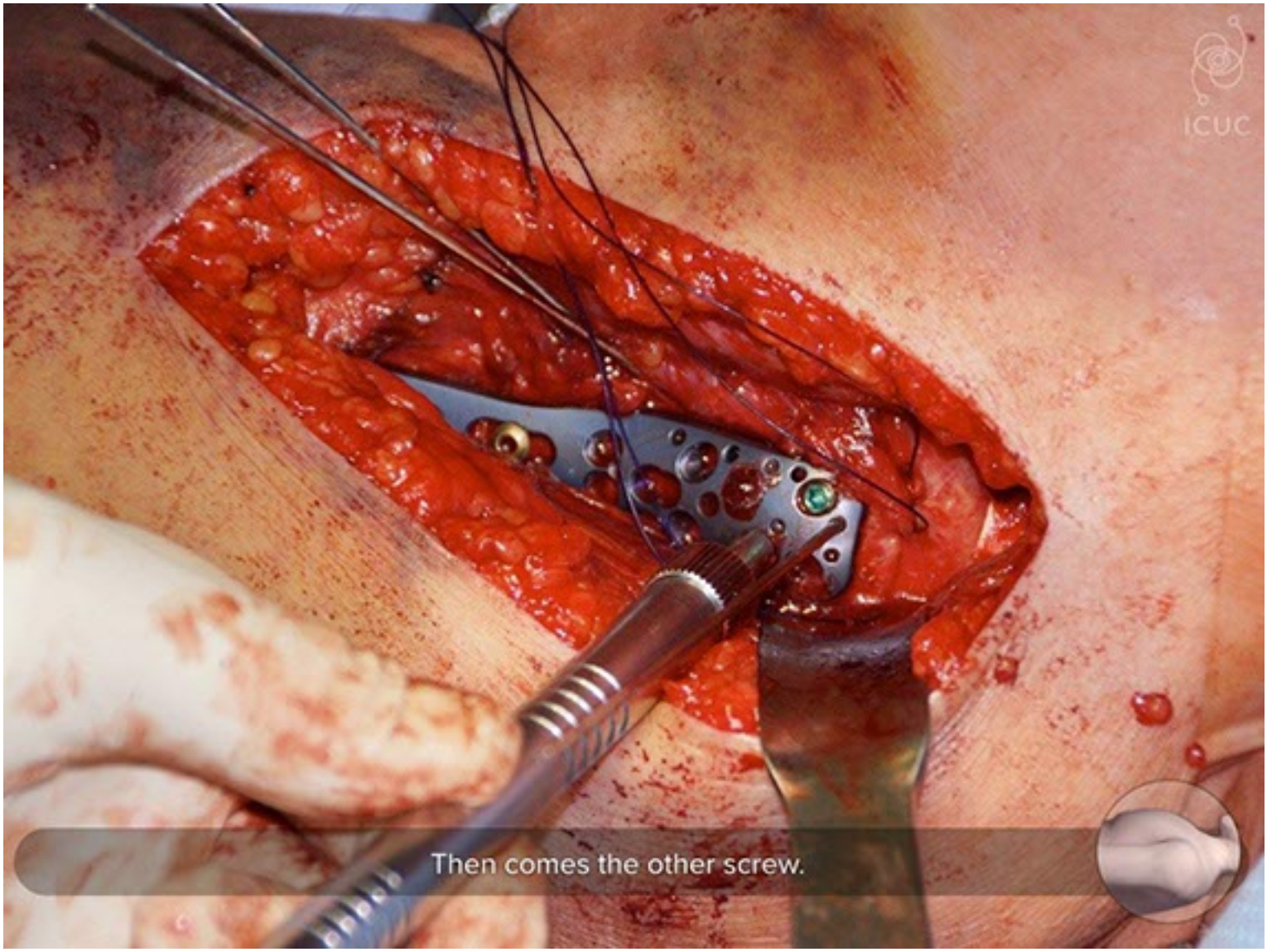
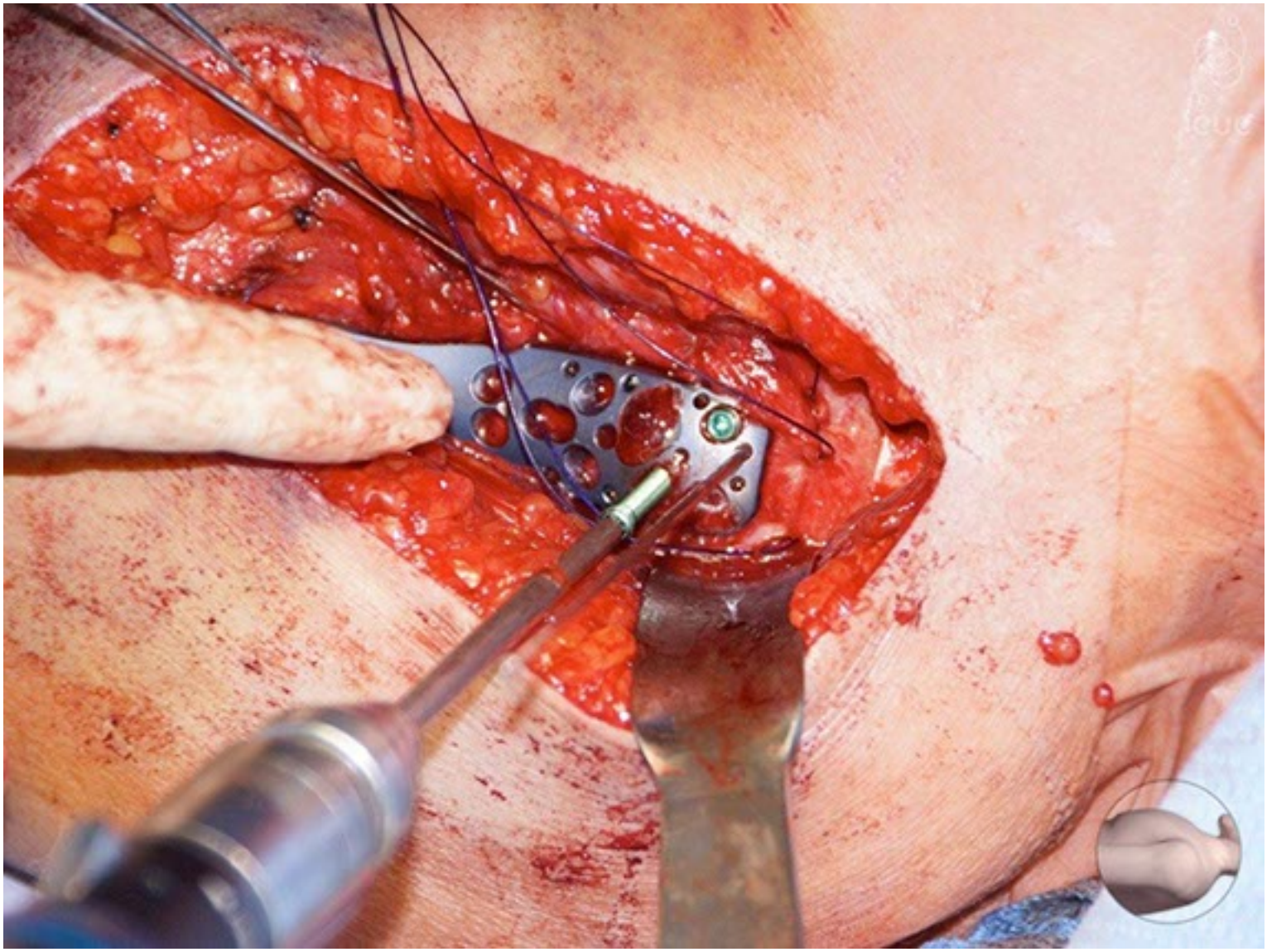
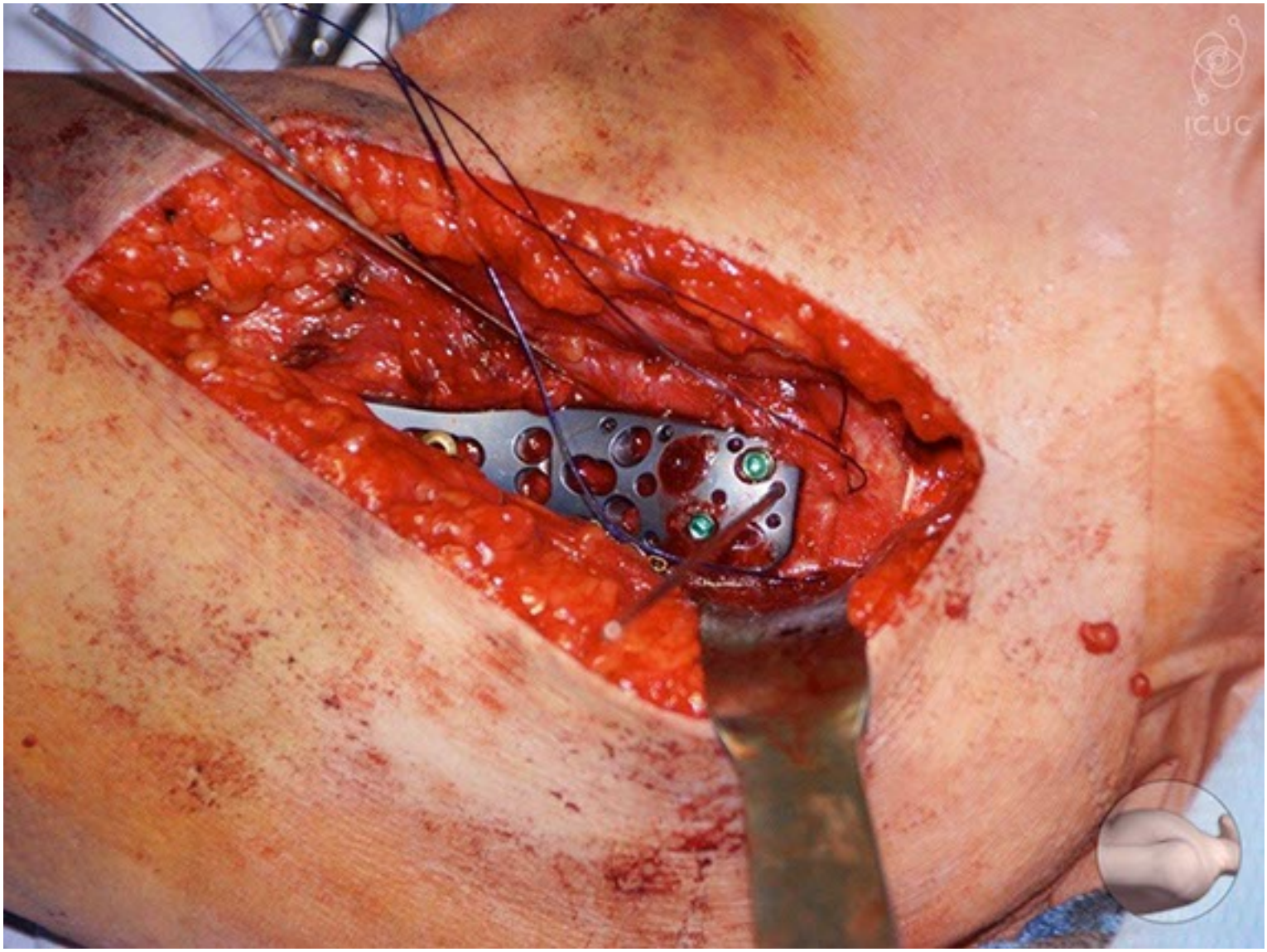
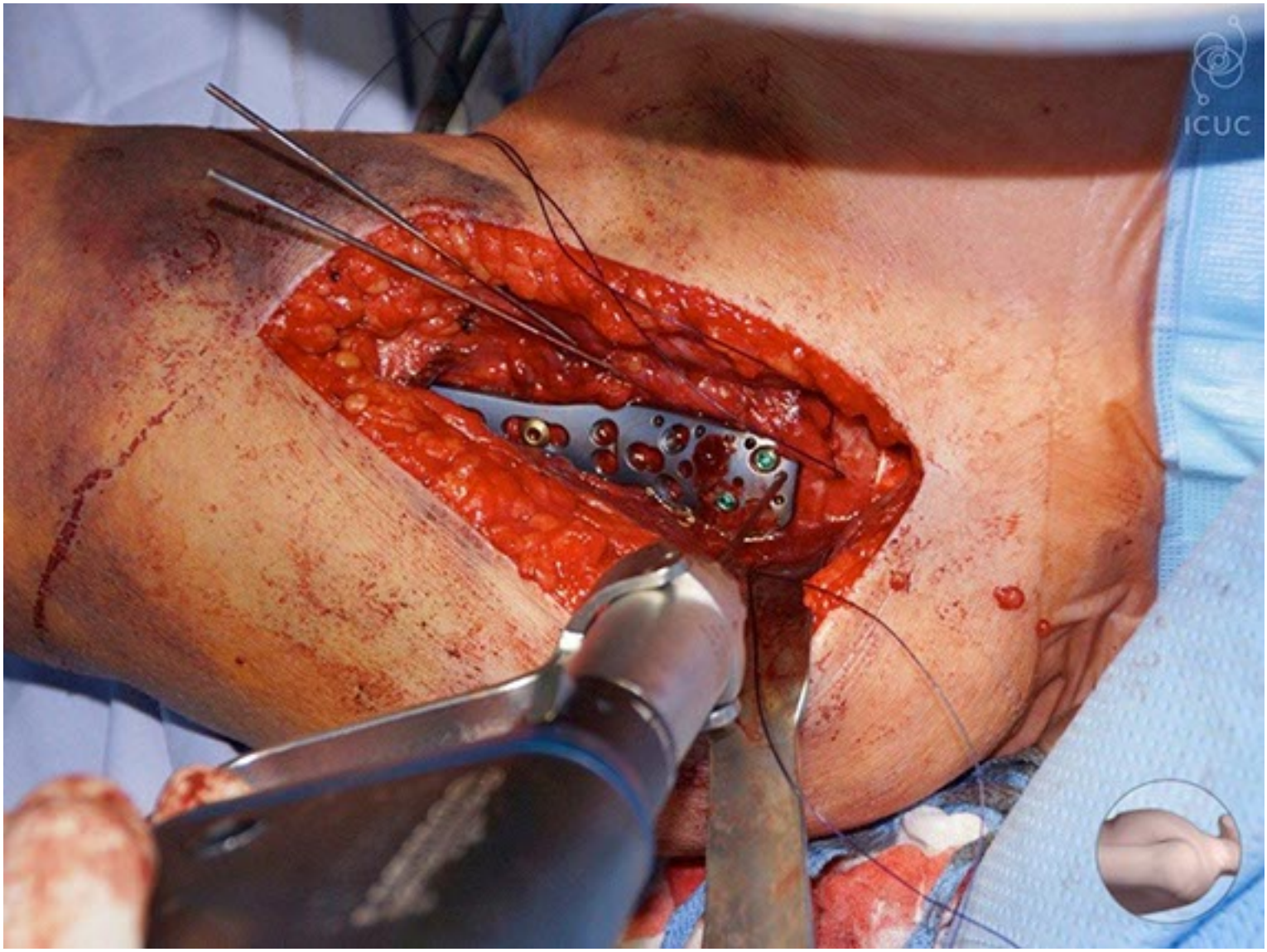

ICUC
Then comes the other screw.



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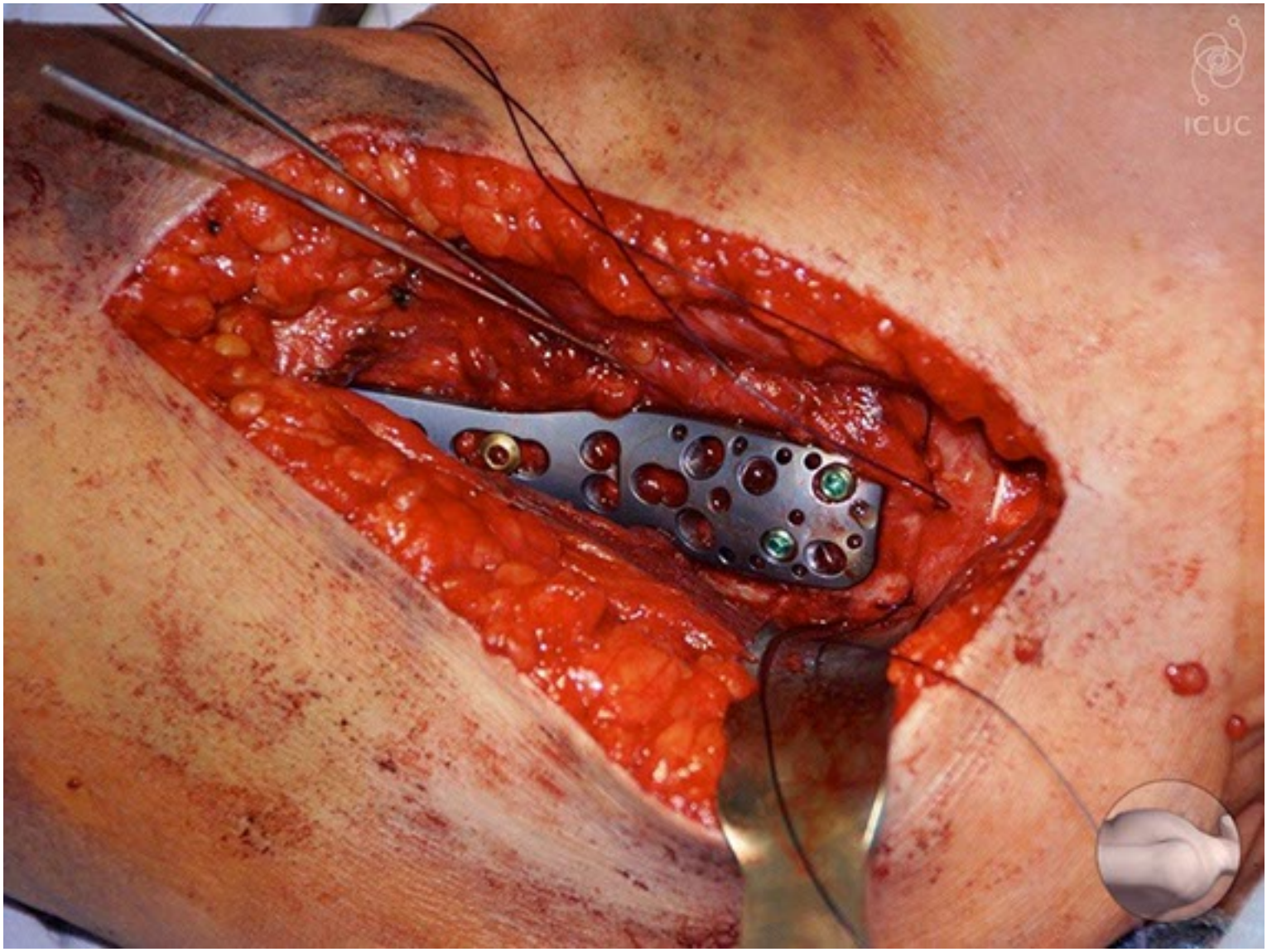
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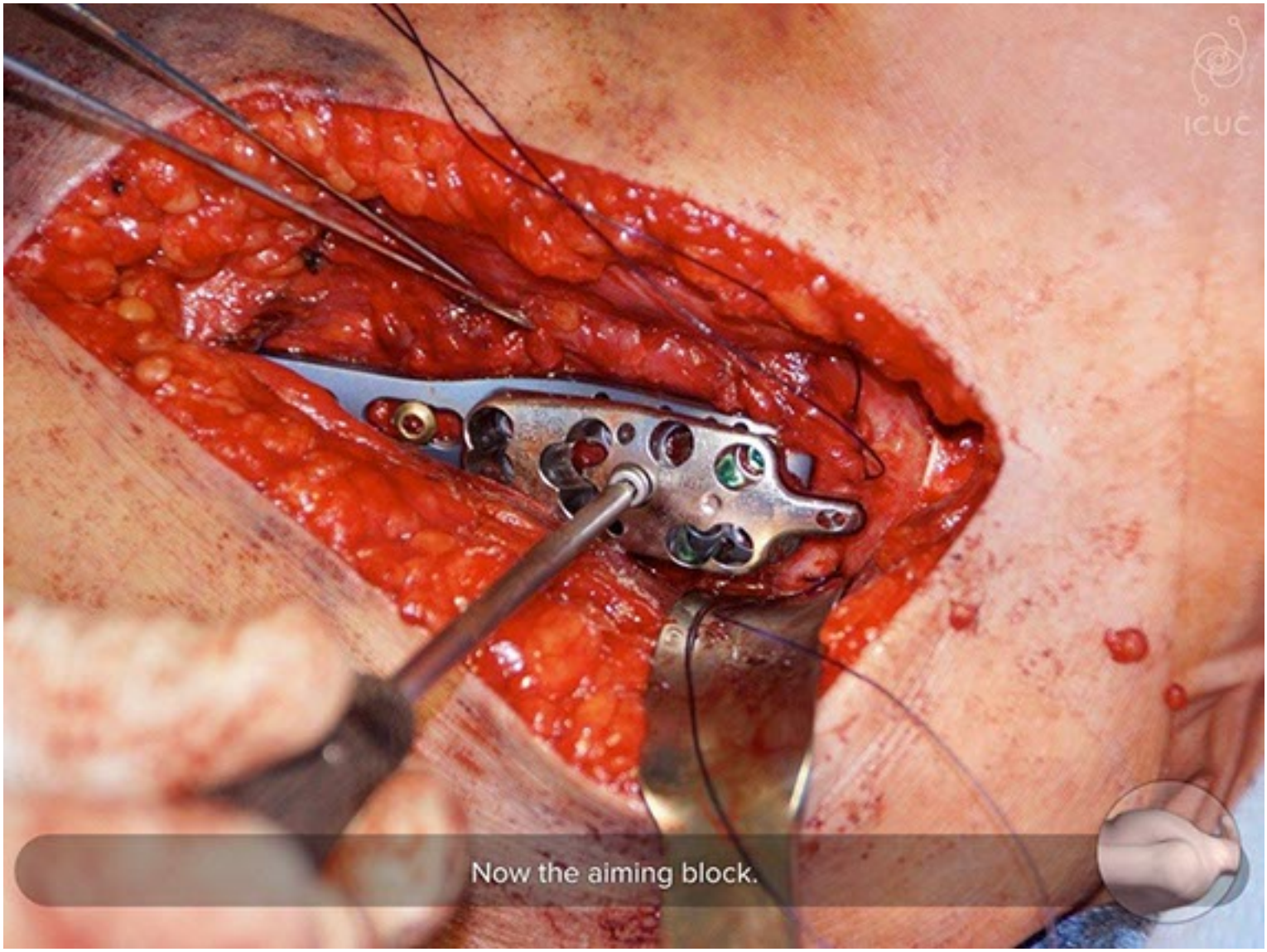
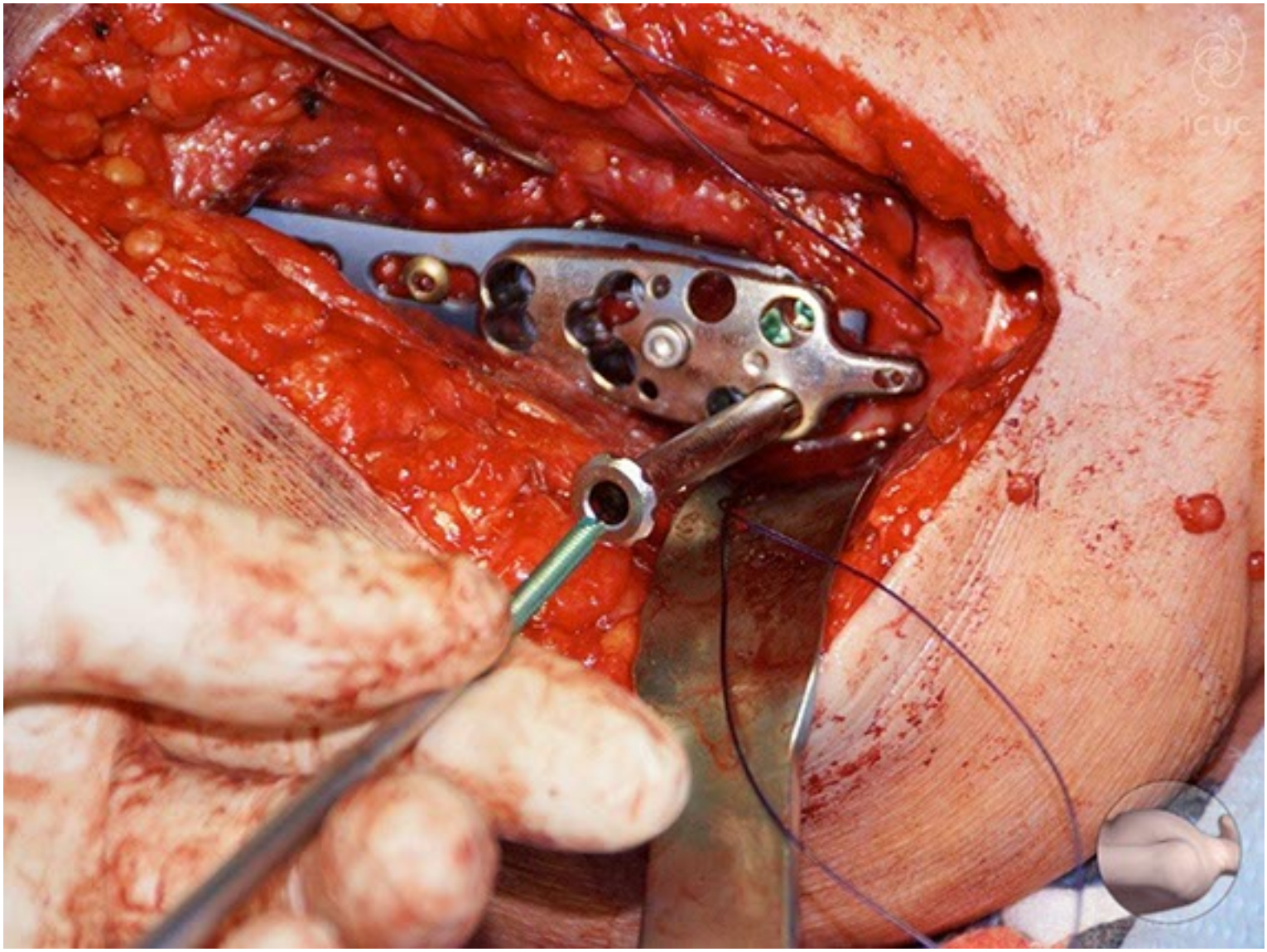
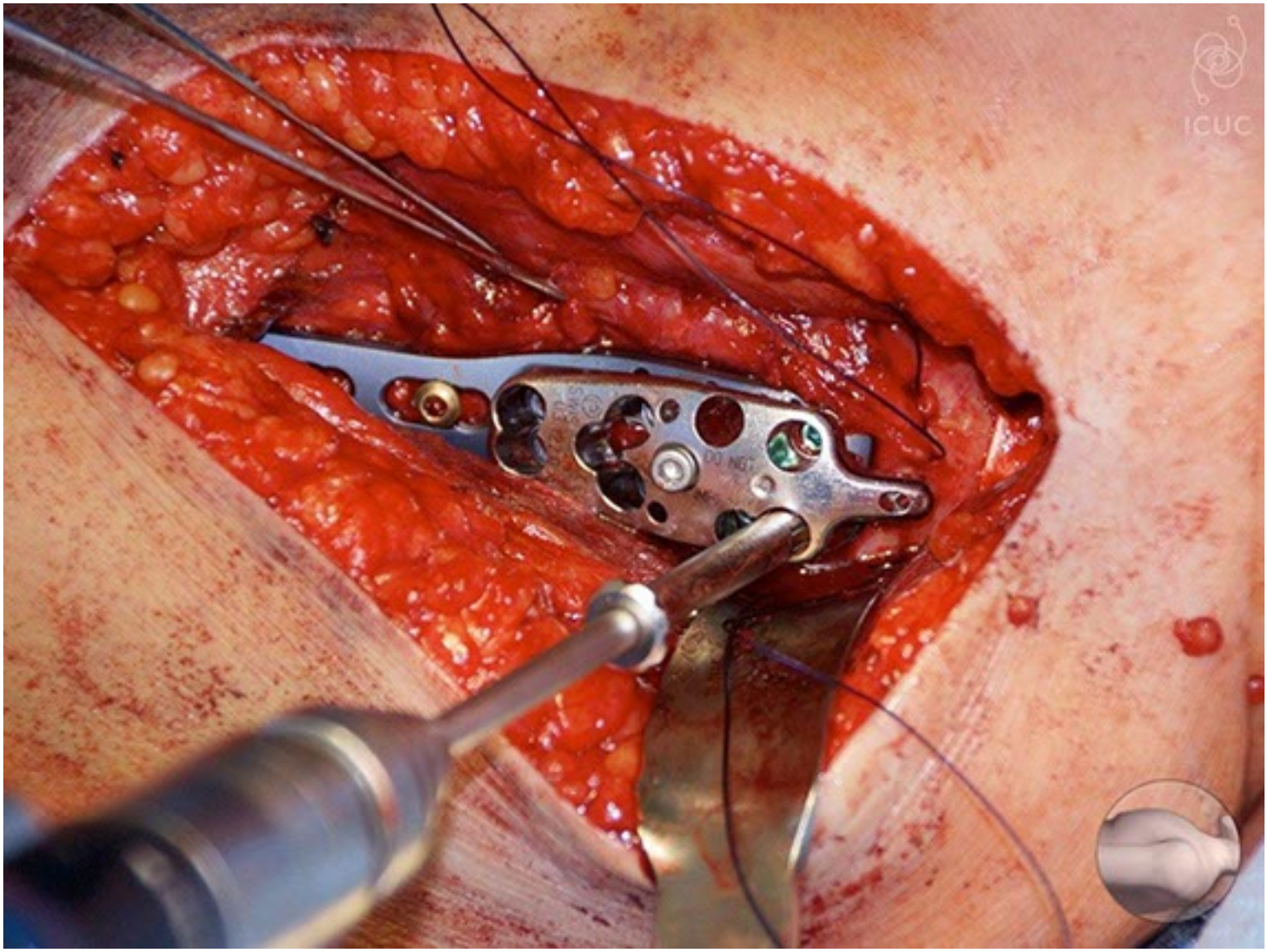
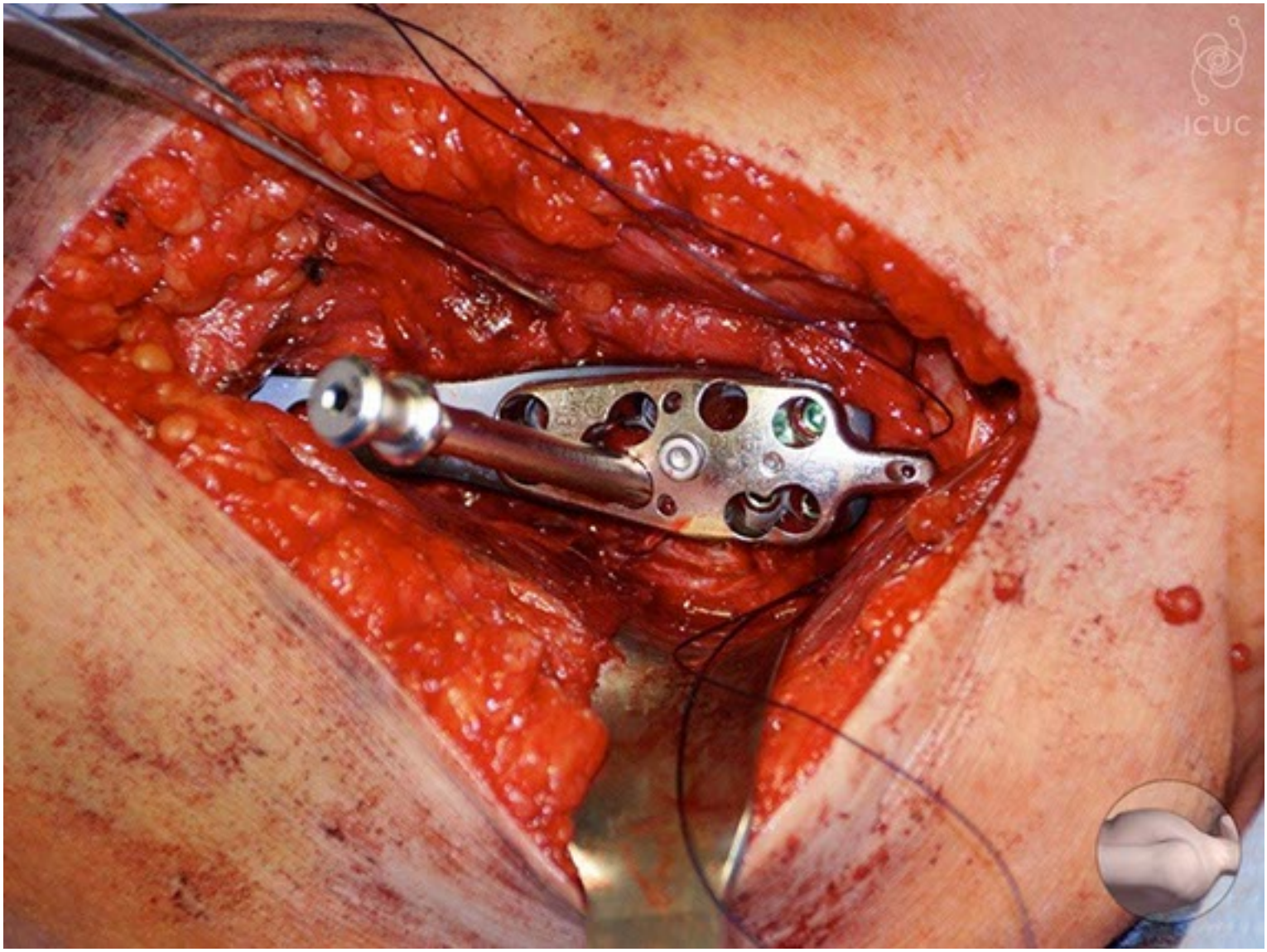
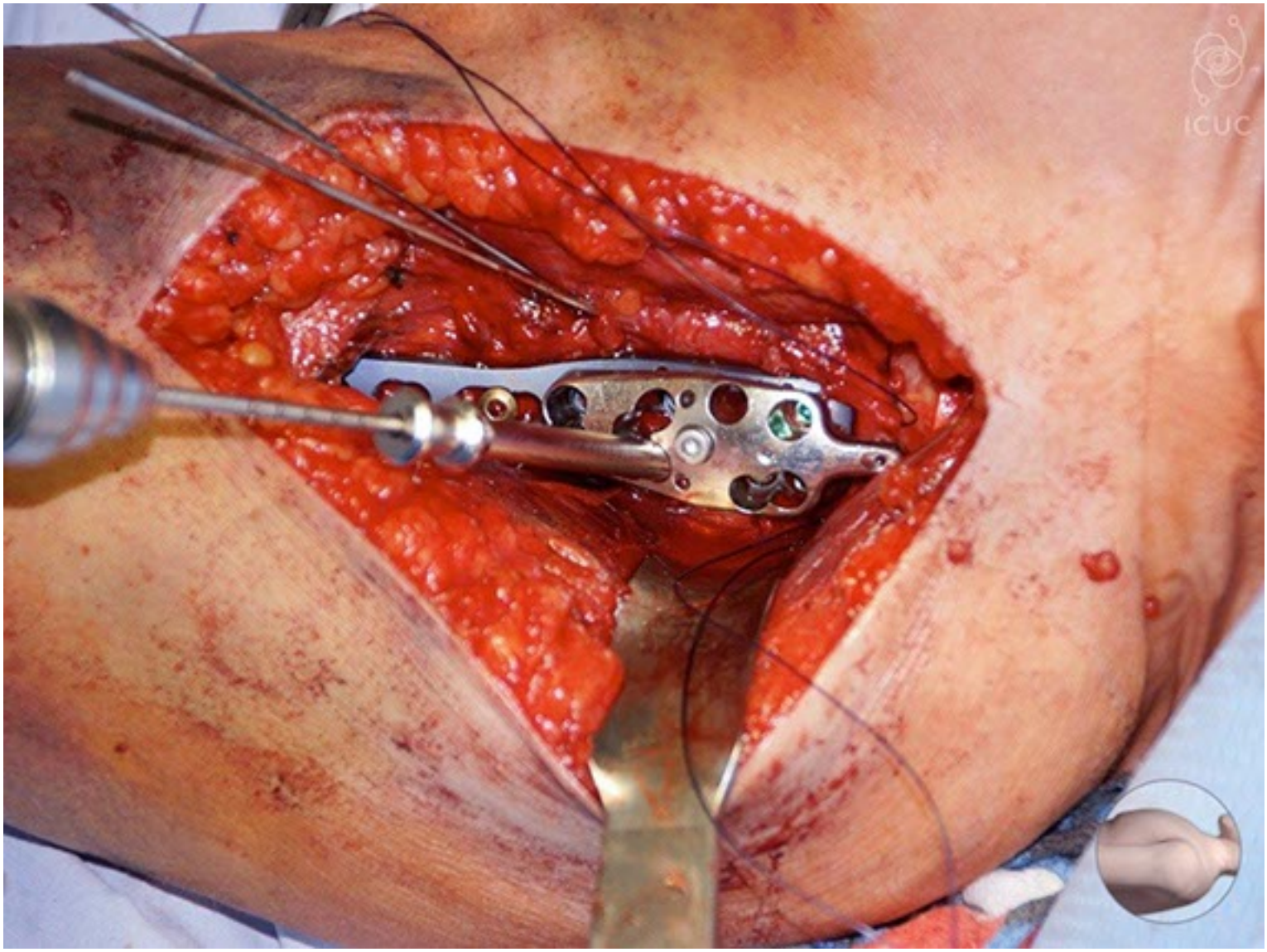
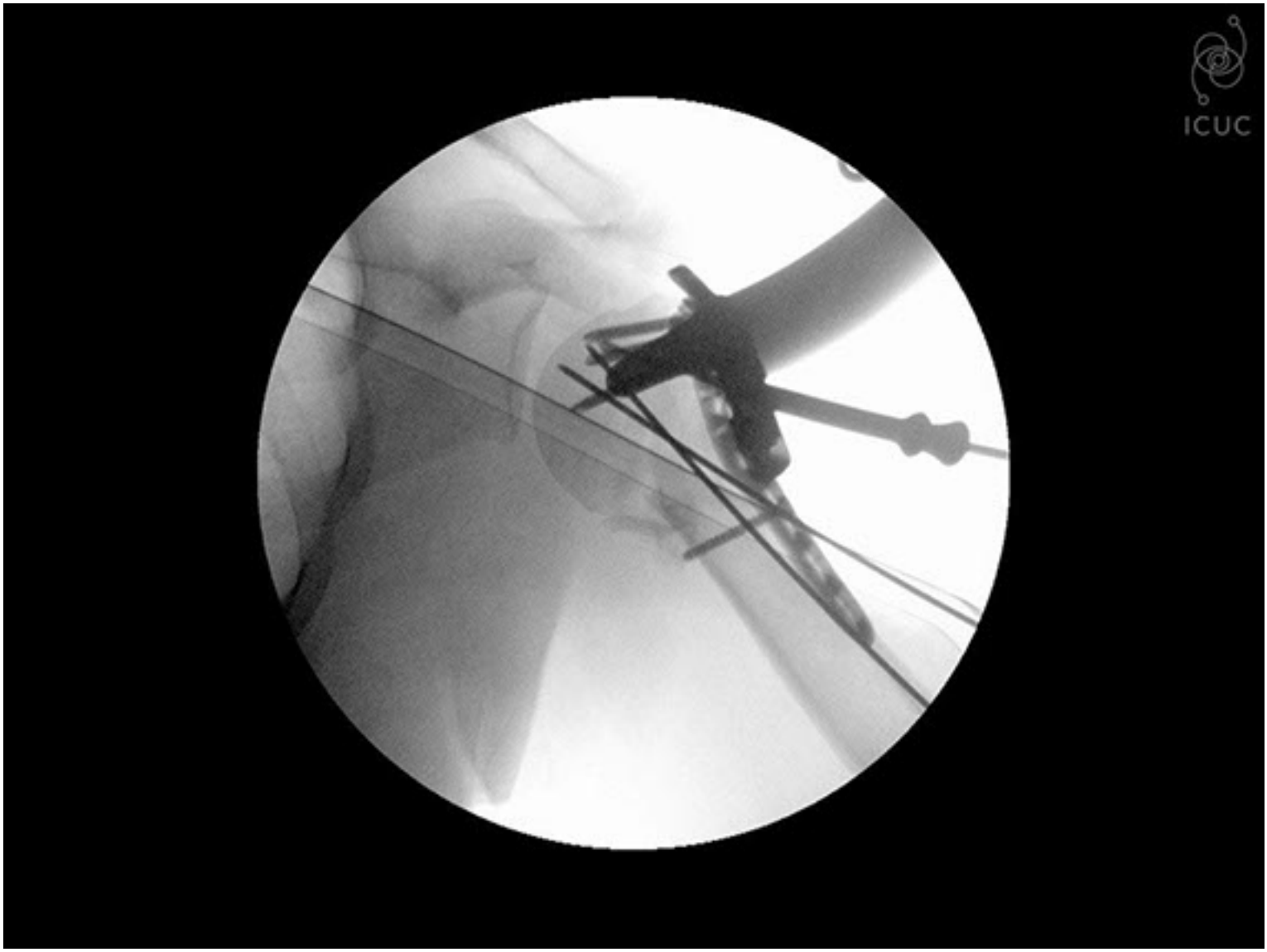

Now the aiming block.







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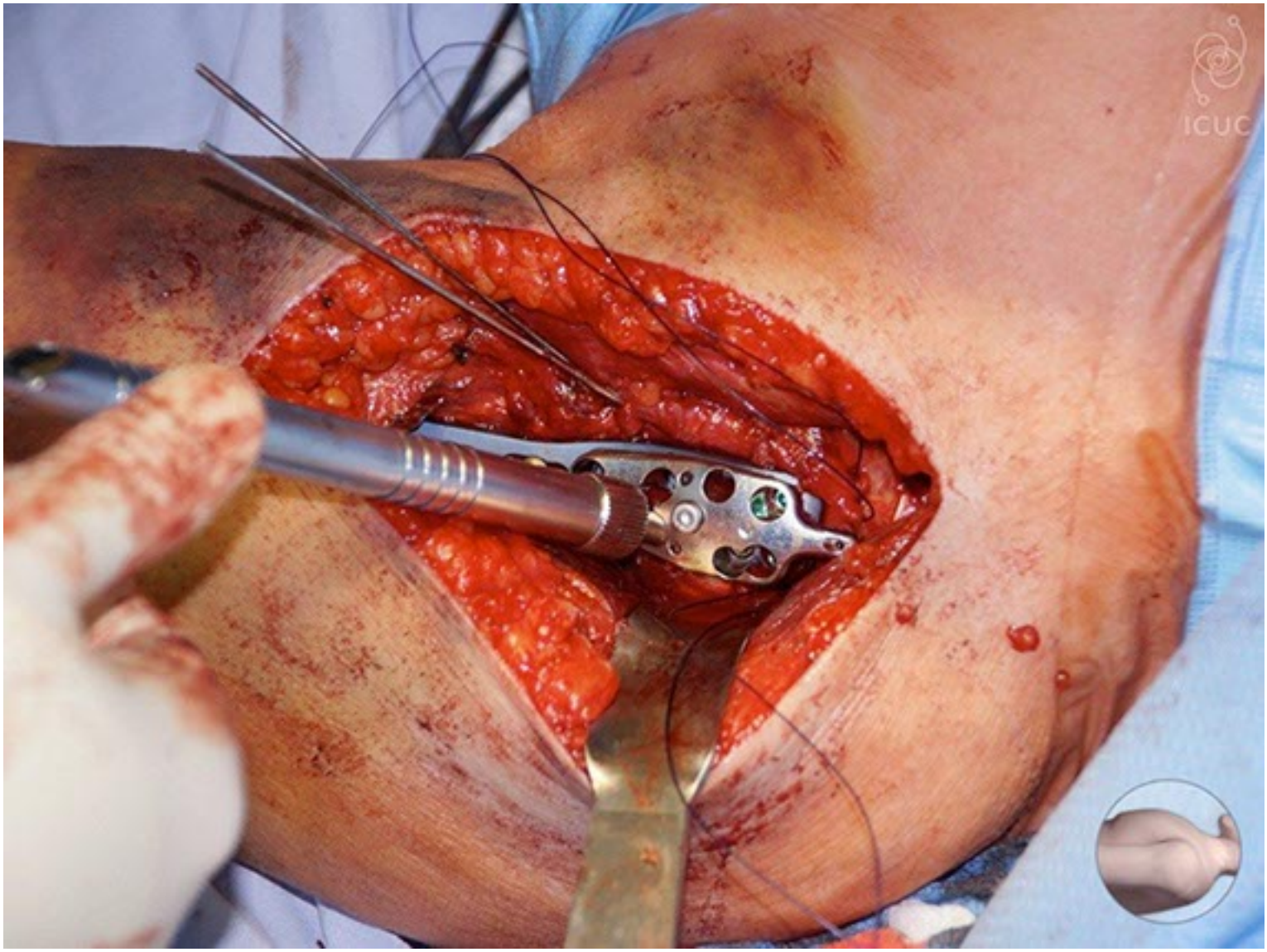

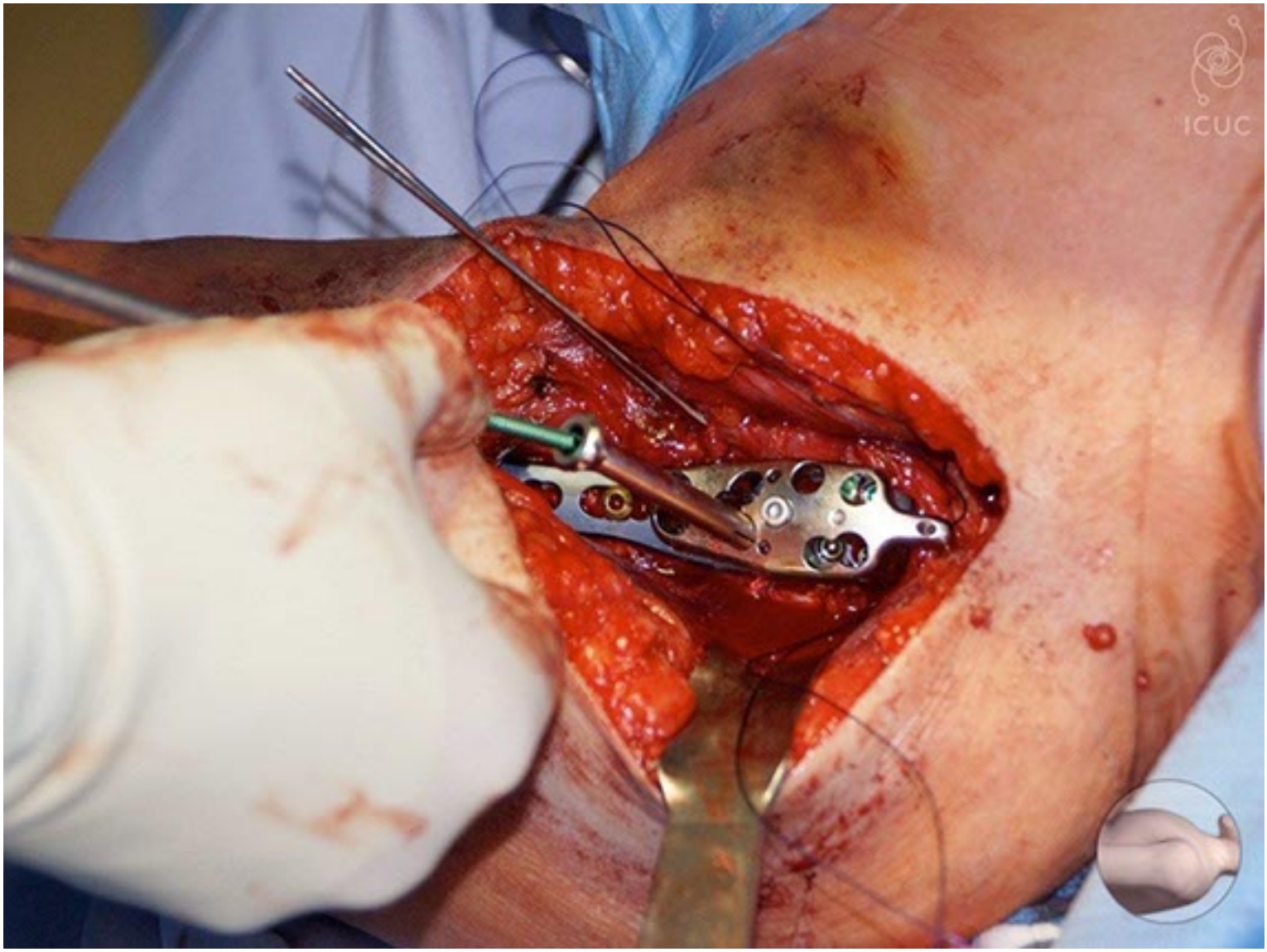
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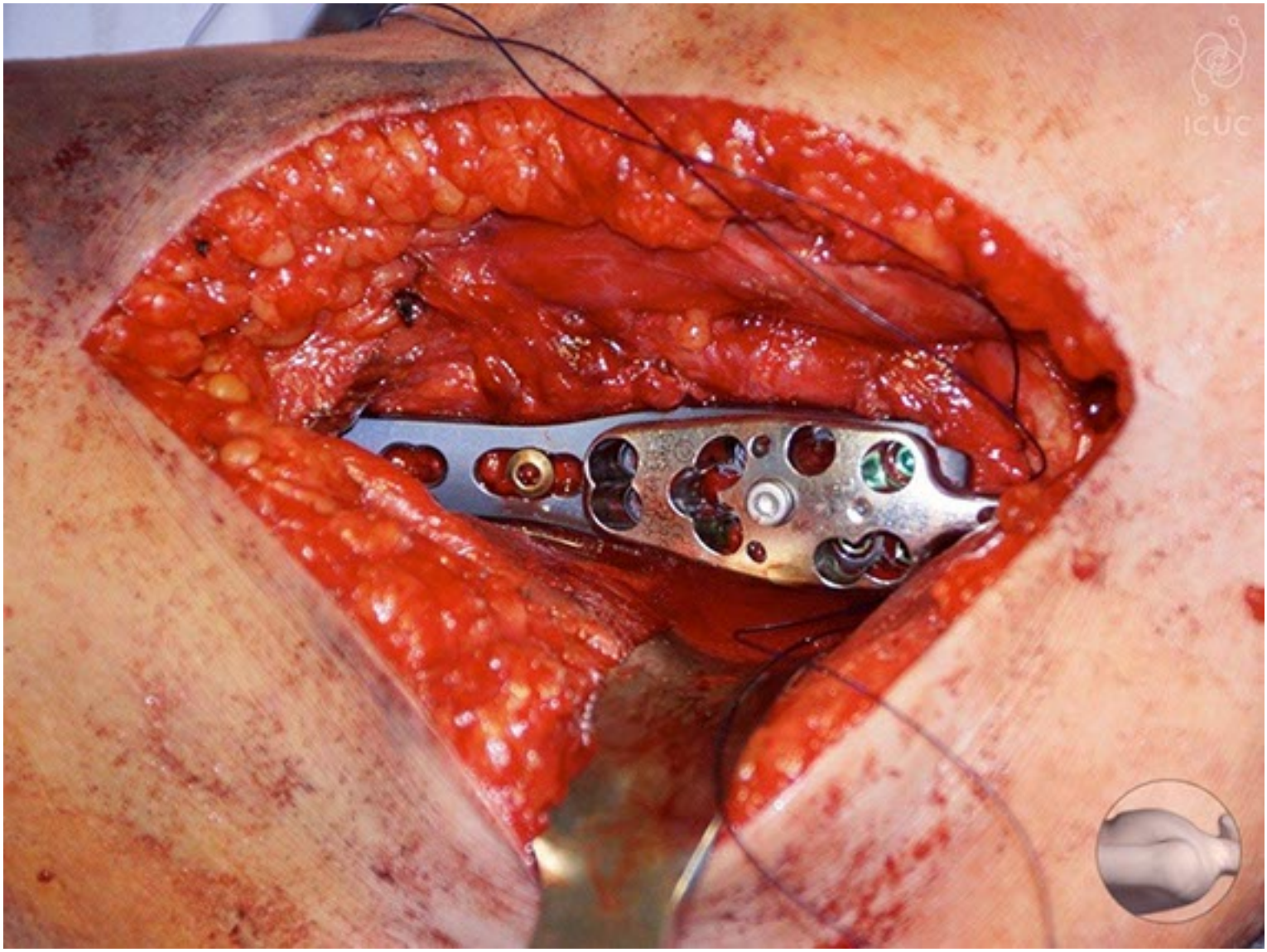
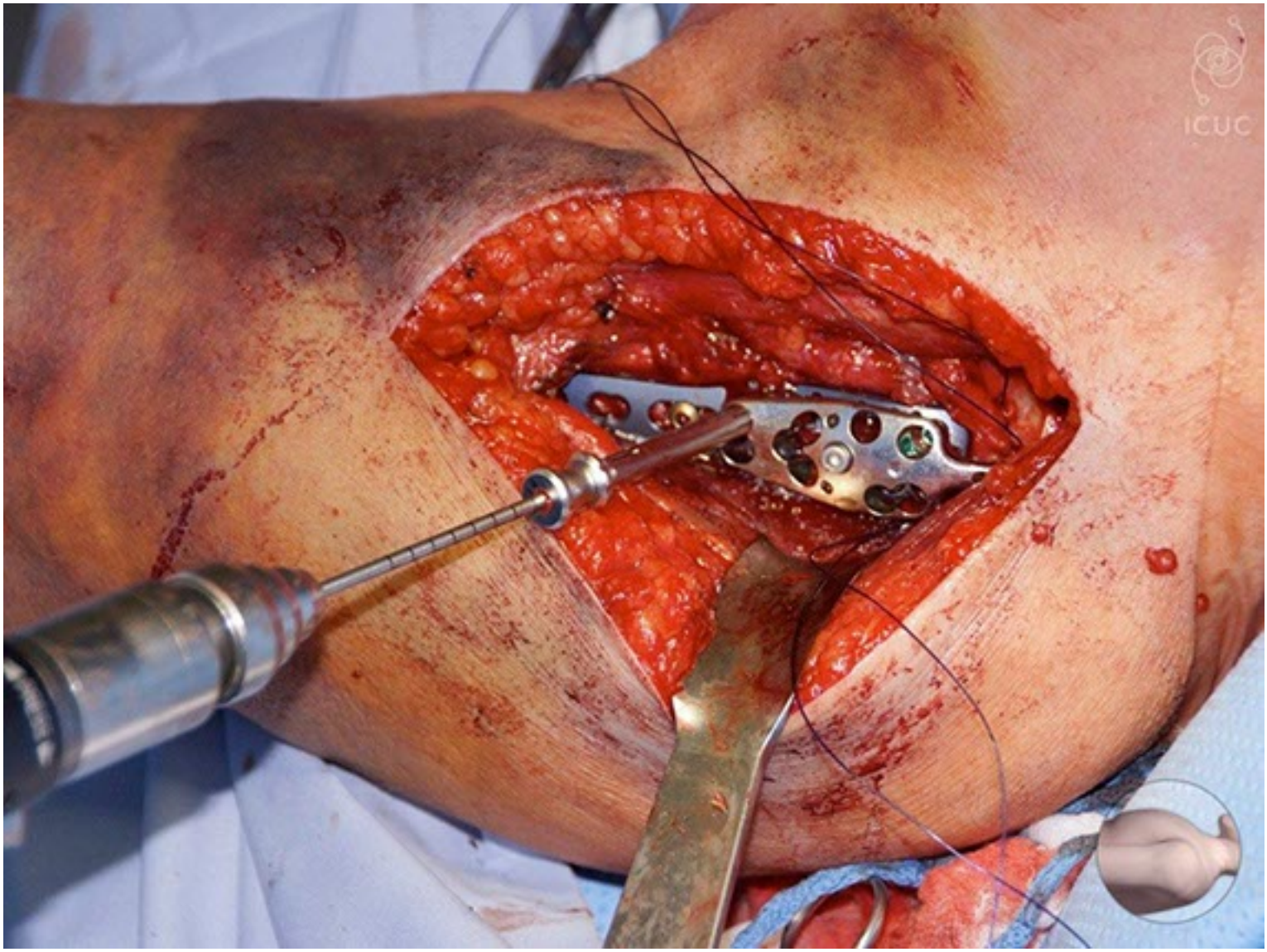
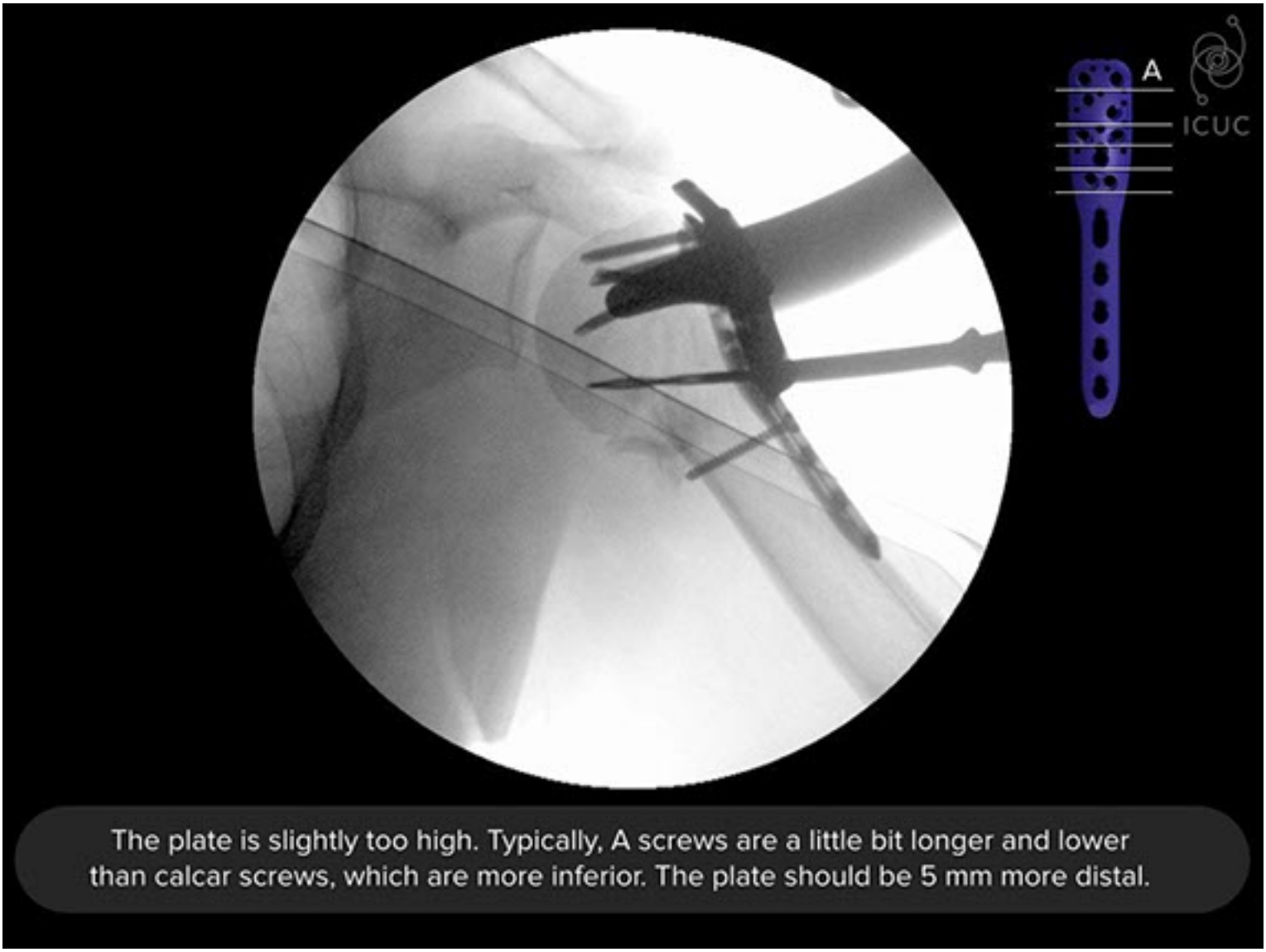
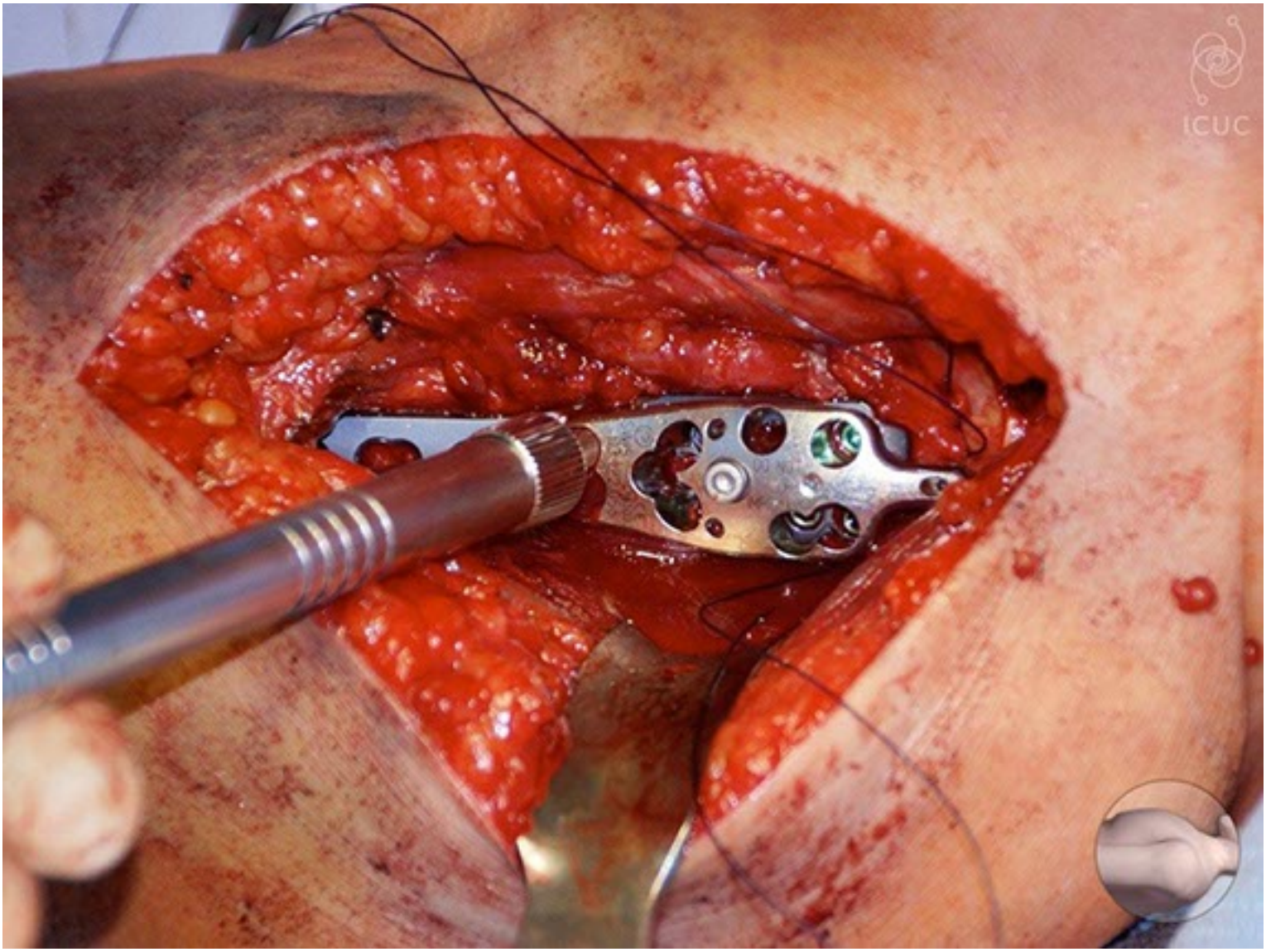





A
ICUC
The plate is slightly too high. Typically, A screws are a little bit longer and lower than calcar screws, which are more inferior. The plate should be 5 mm more distal.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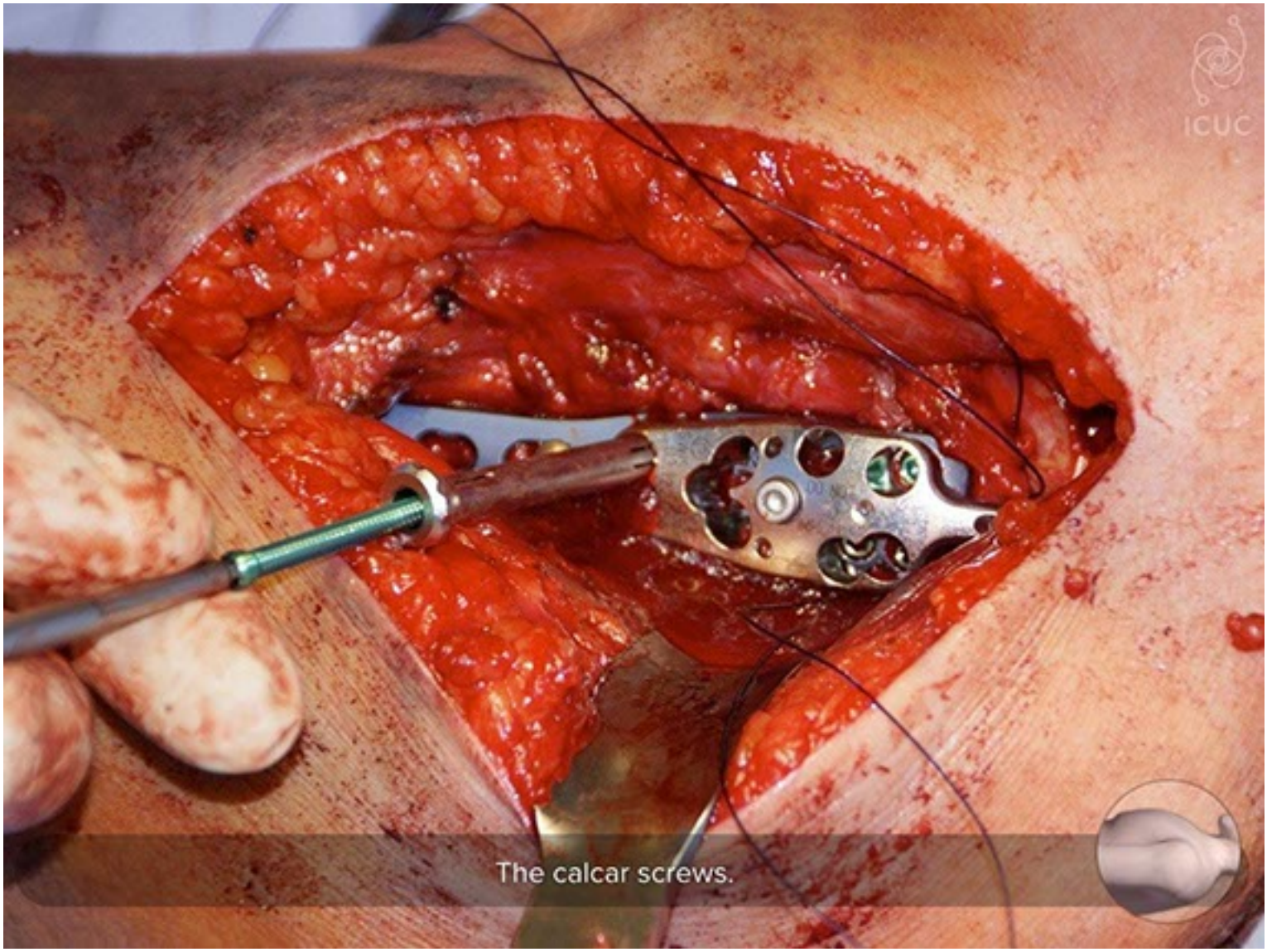
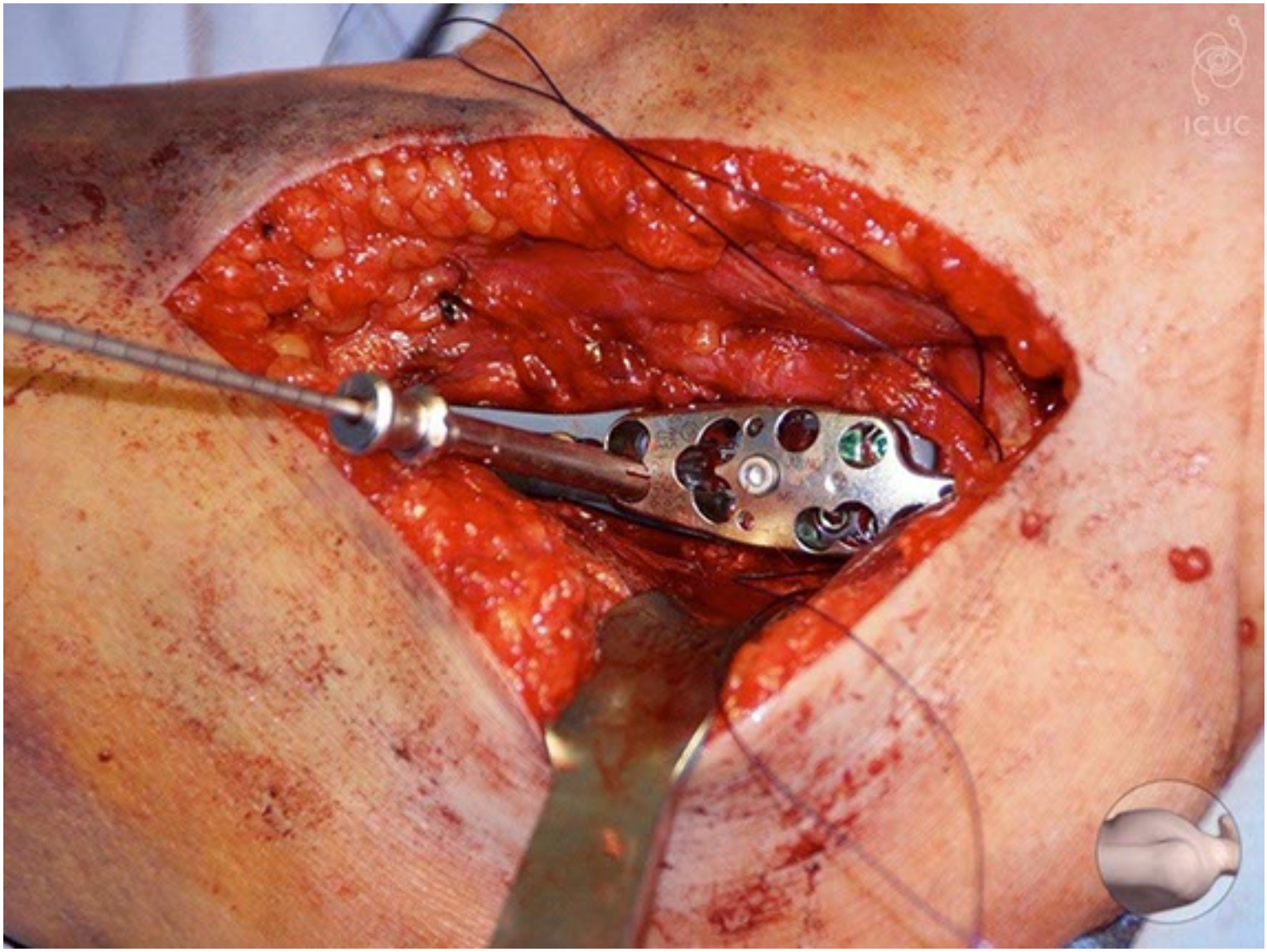
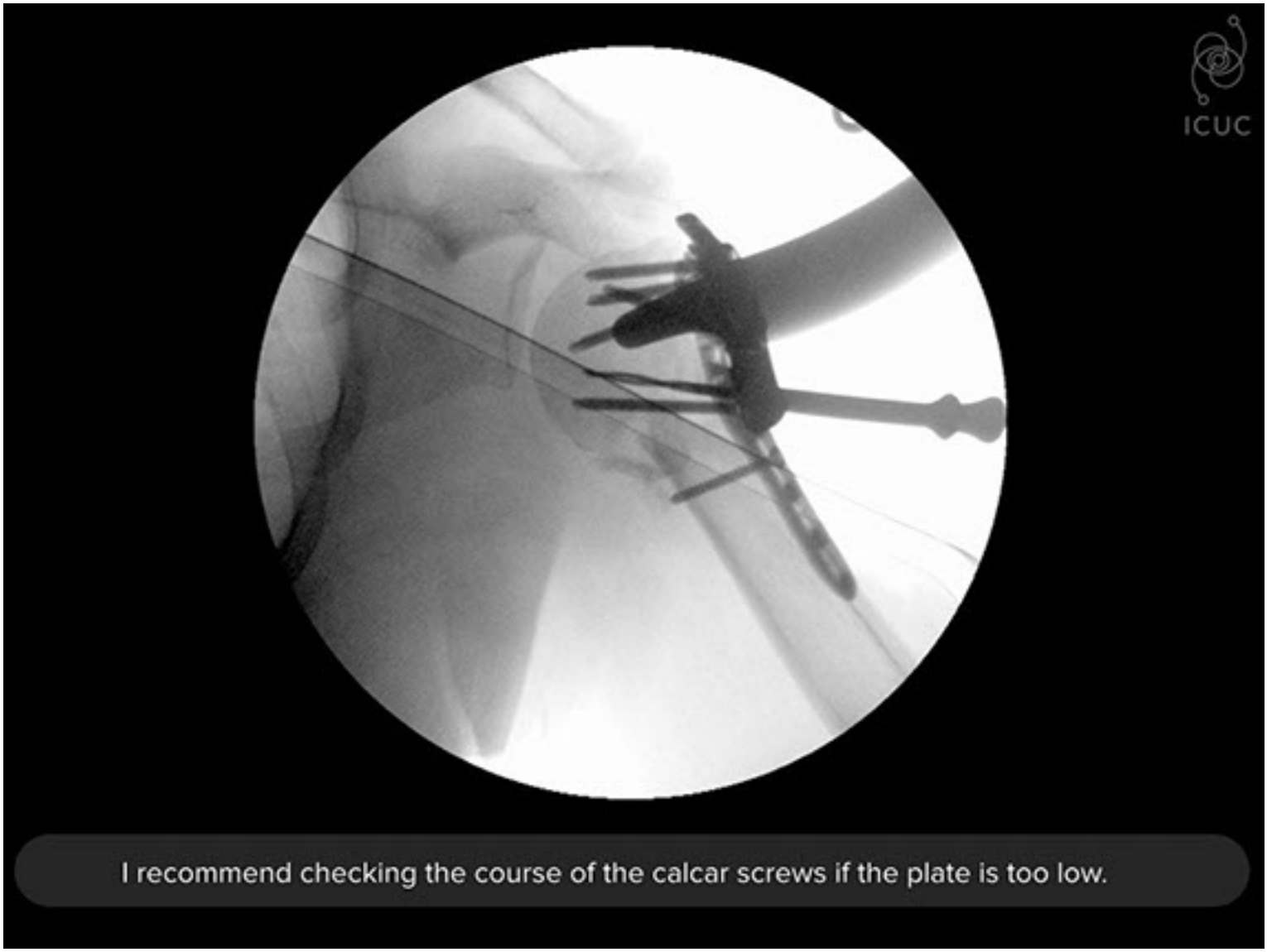
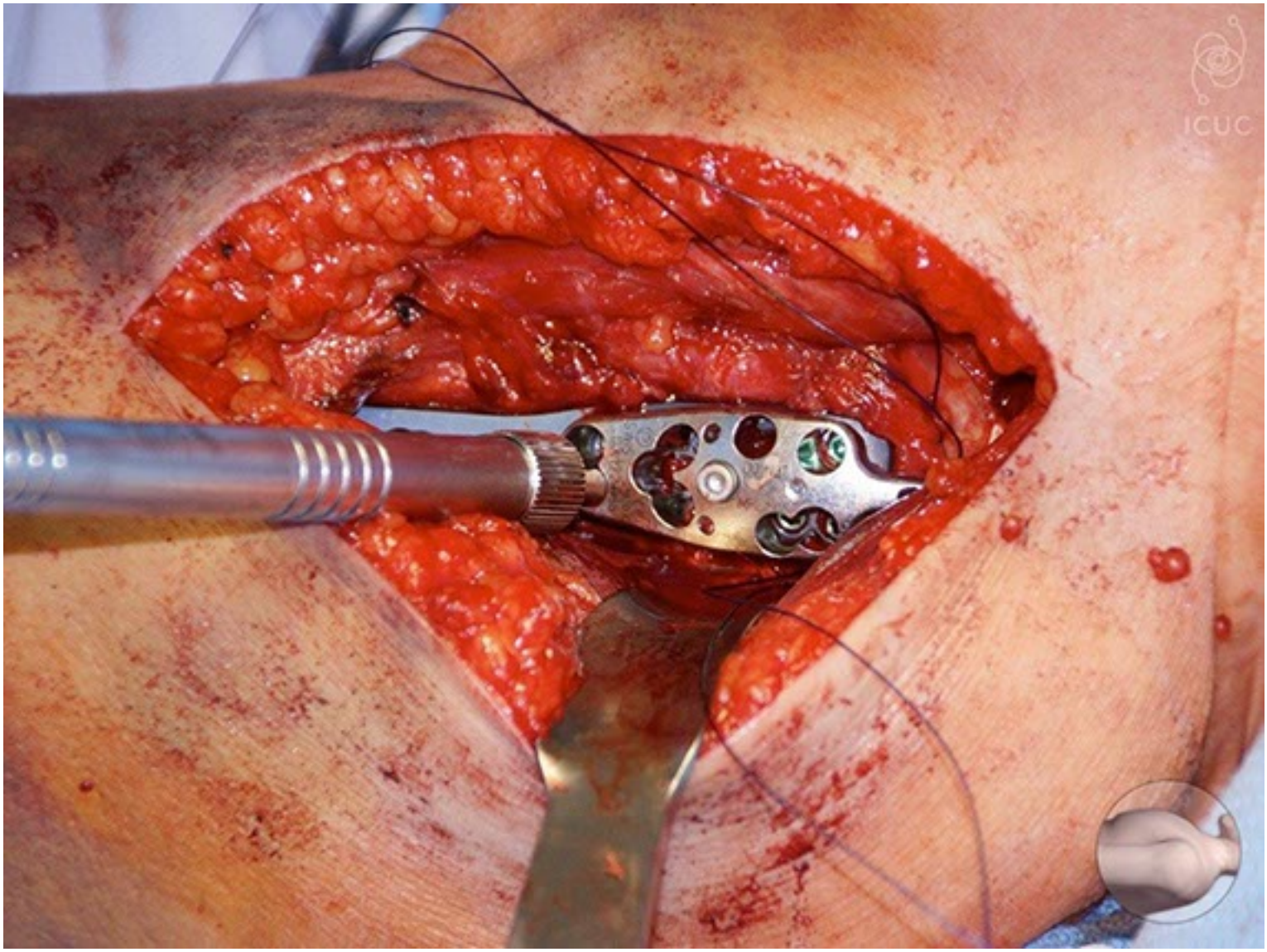
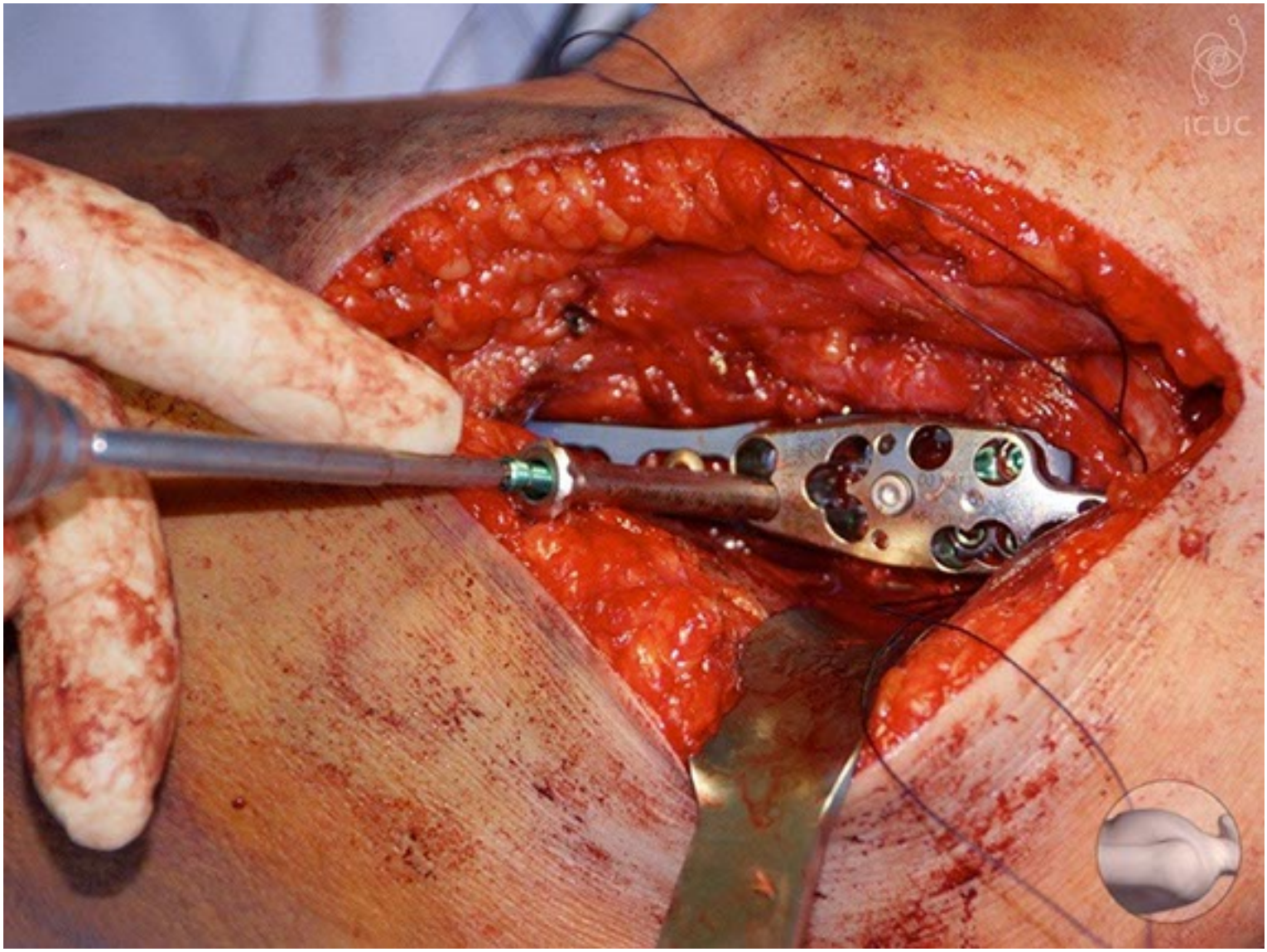

ICUC
The calcar screws.




ICUC
I recommend checking the course of the calcar screws if the plate is too low.

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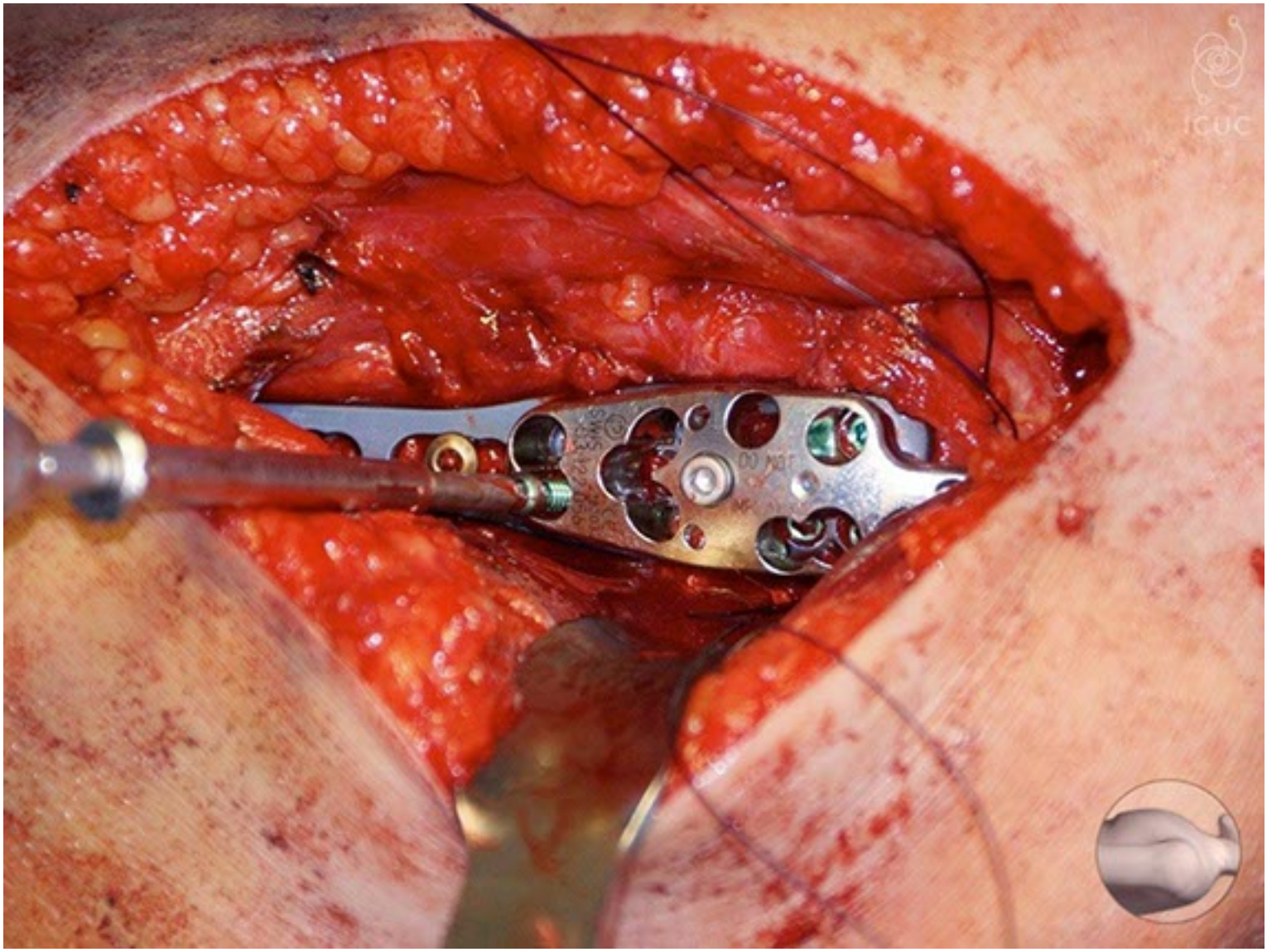

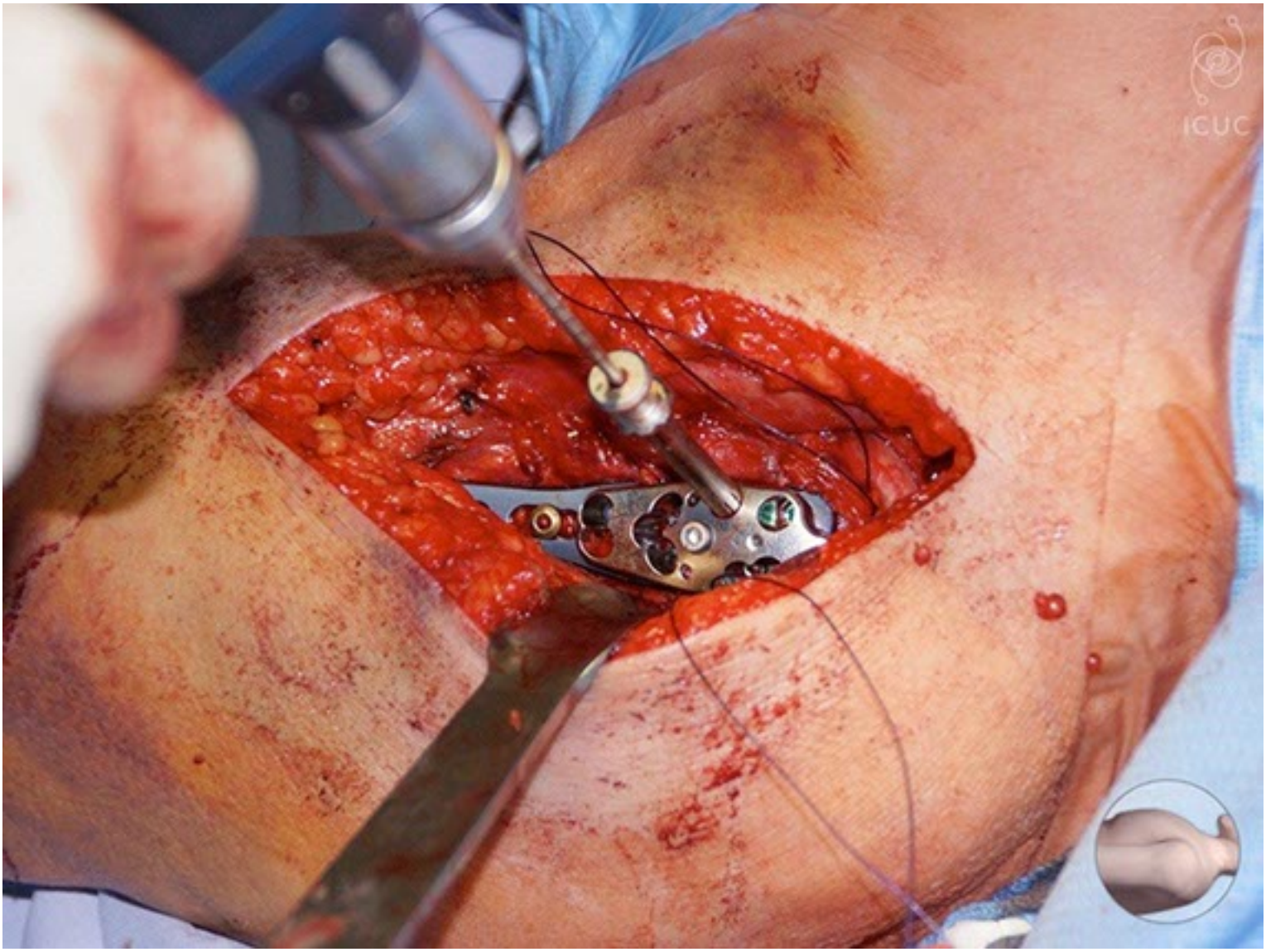
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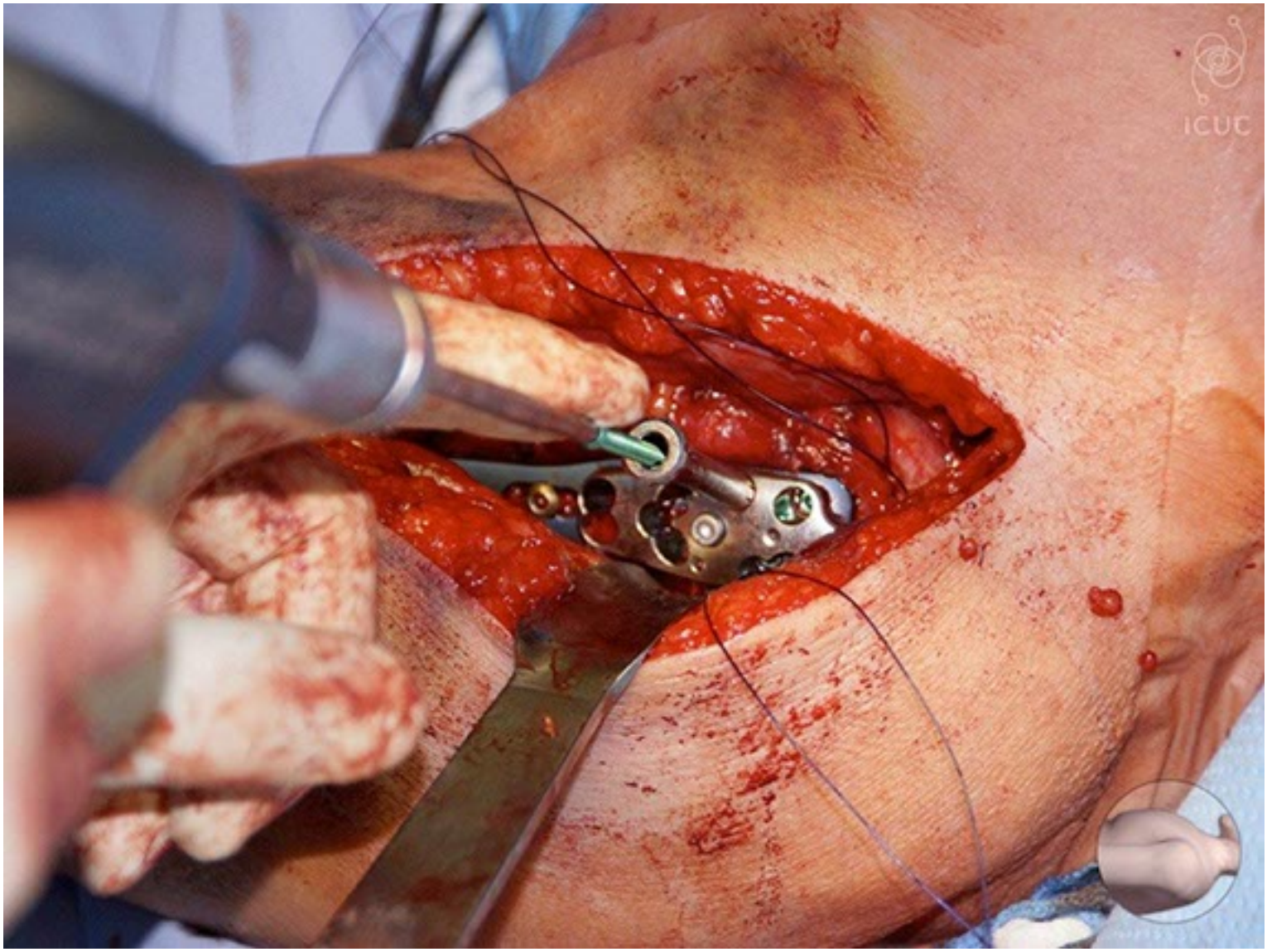
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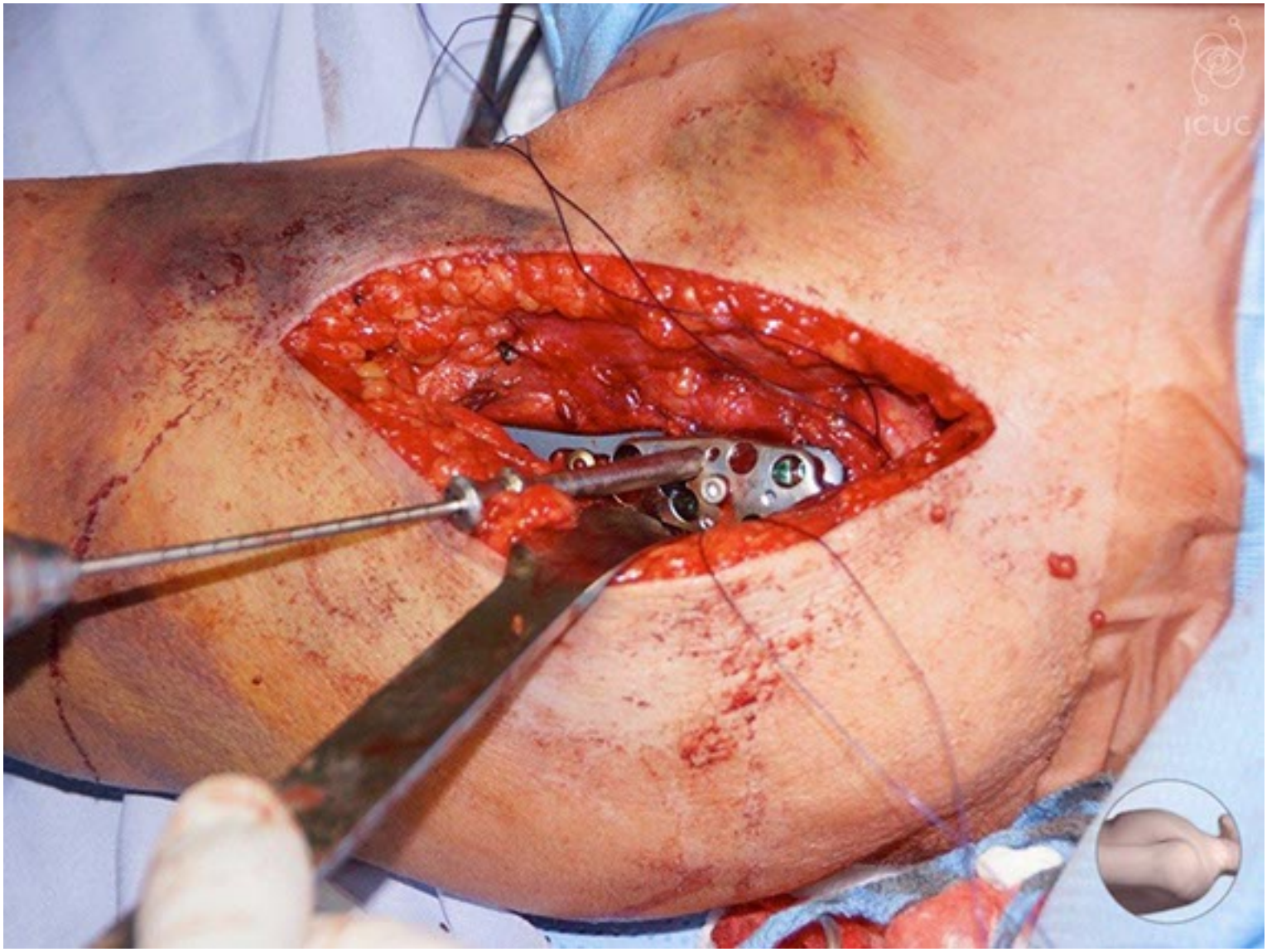

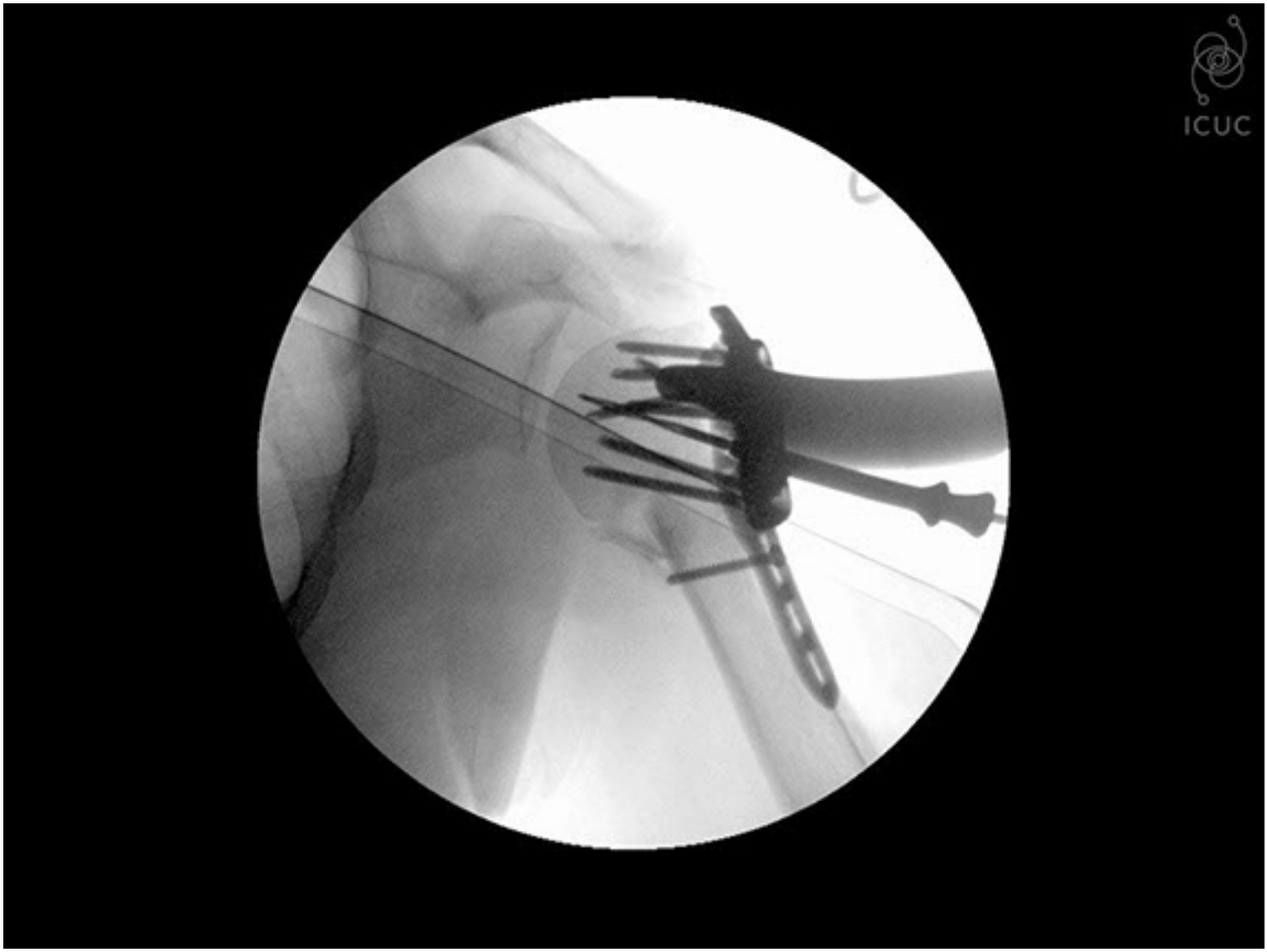
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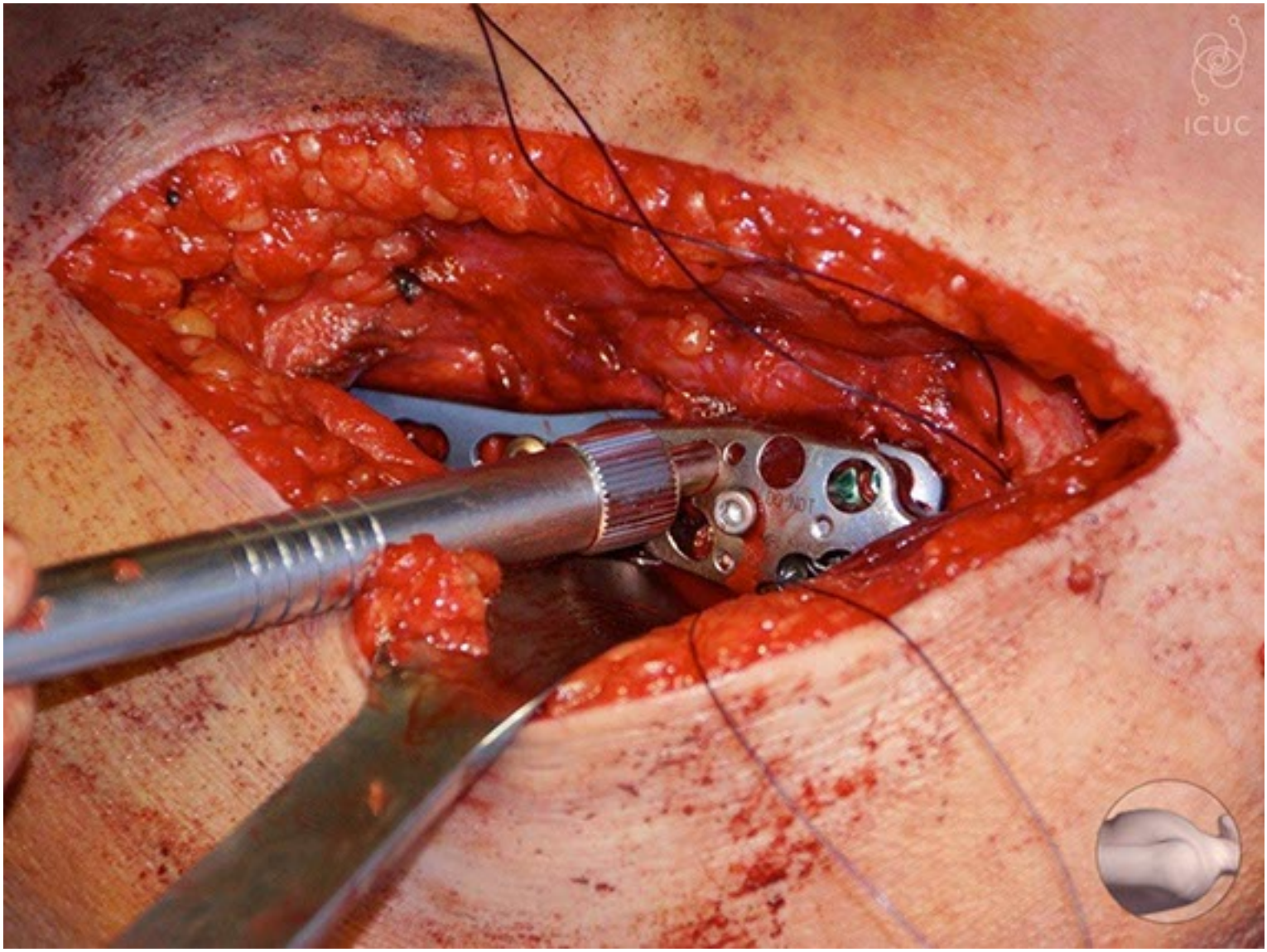
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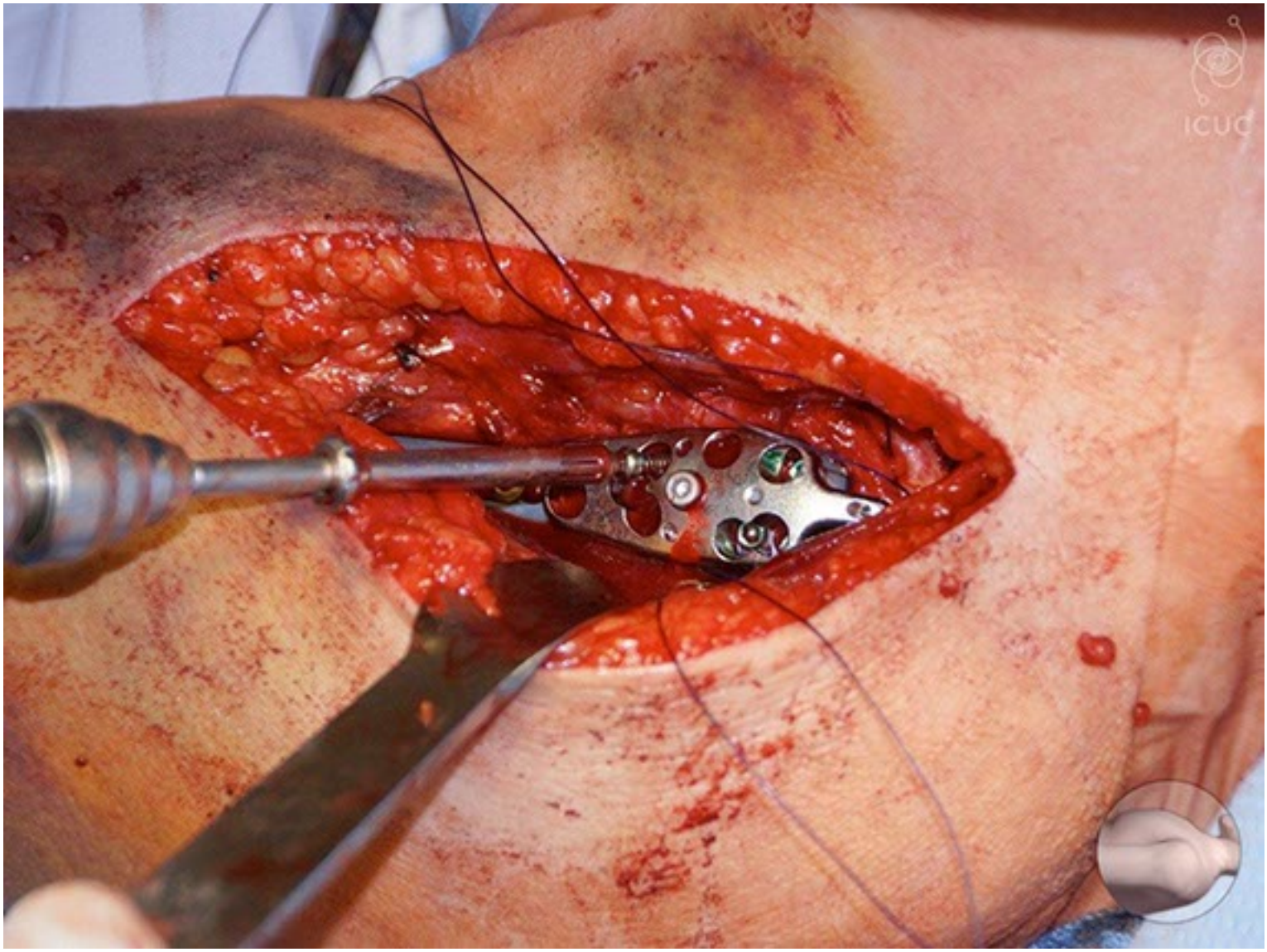

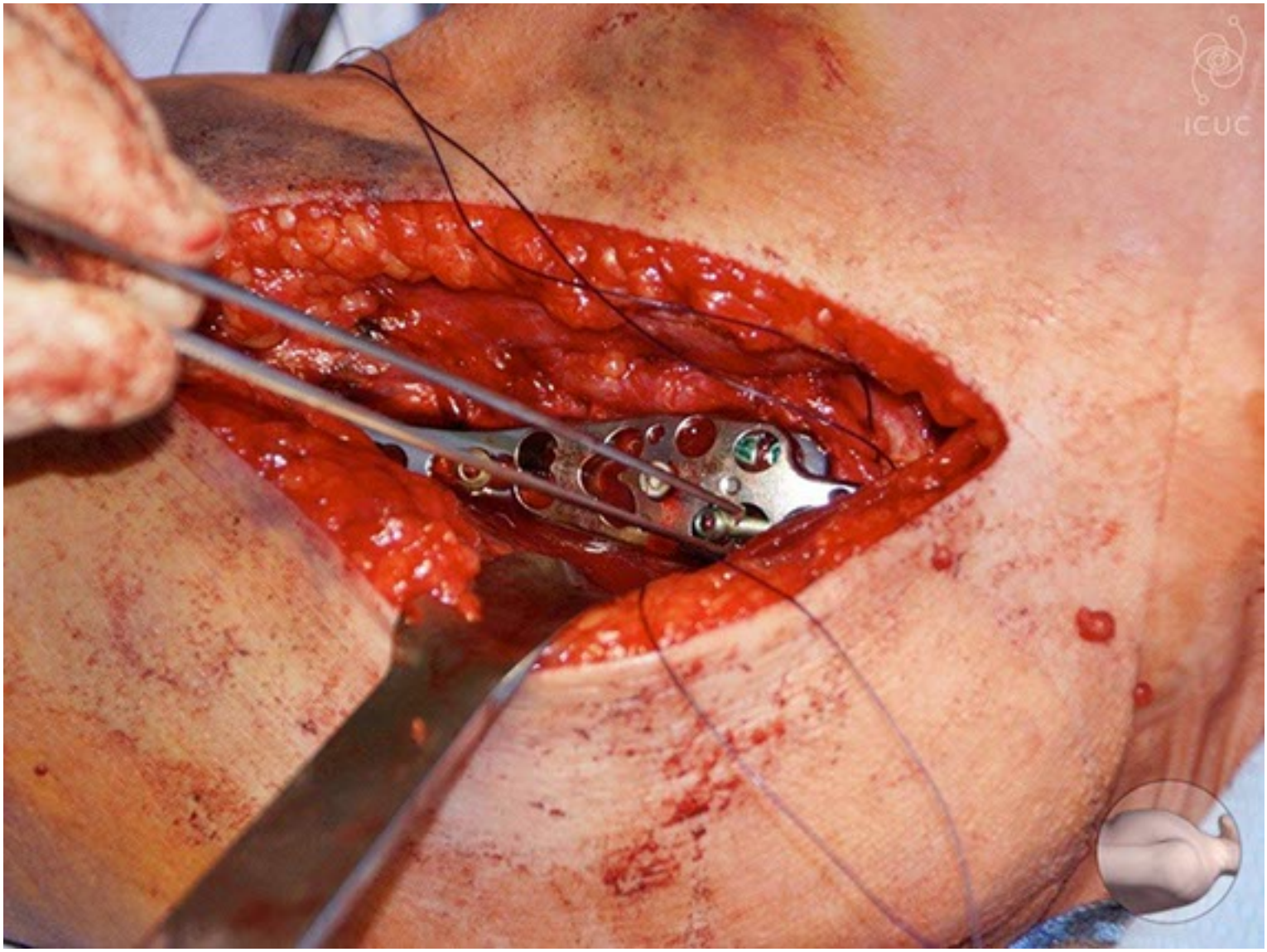

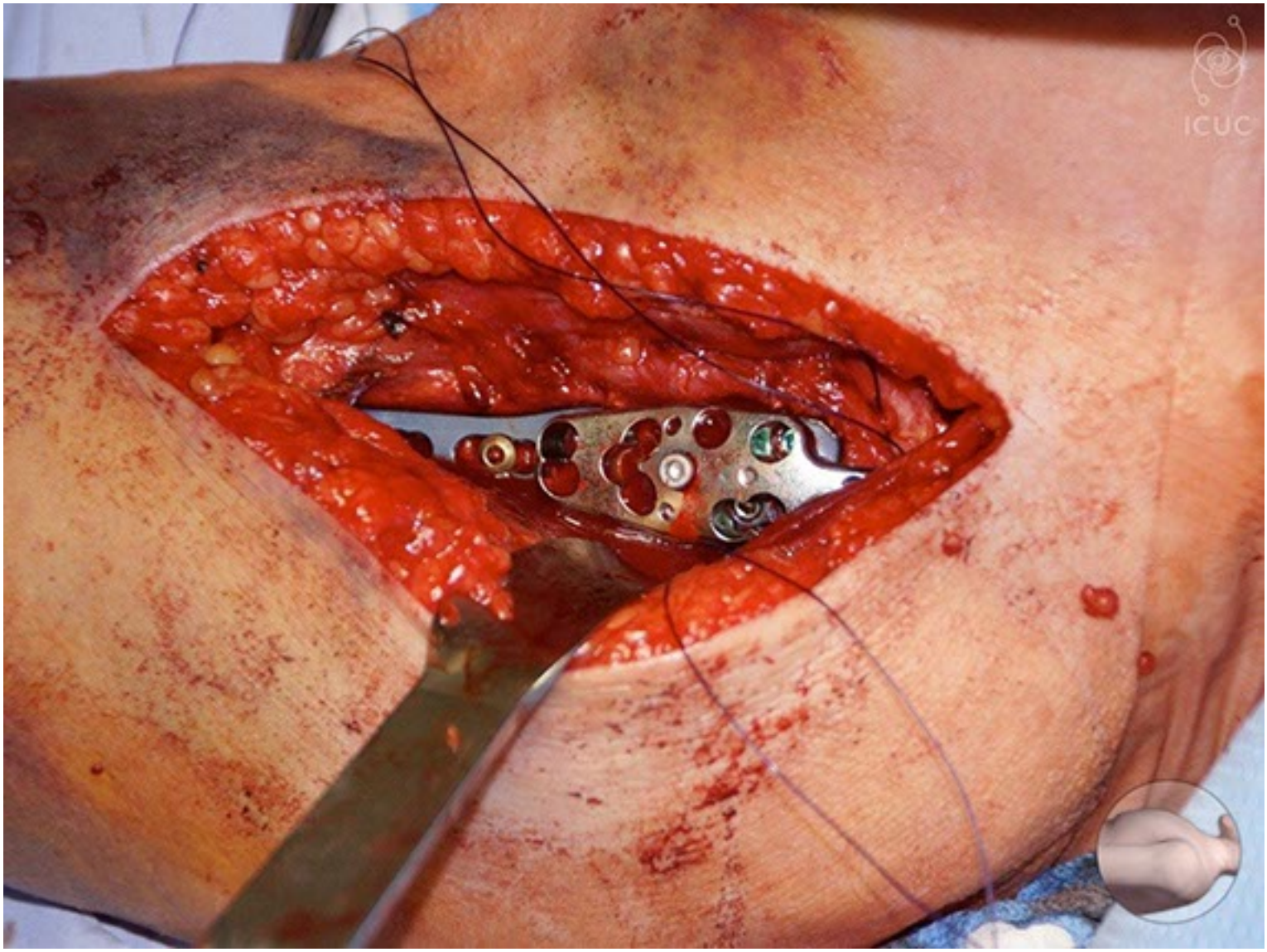

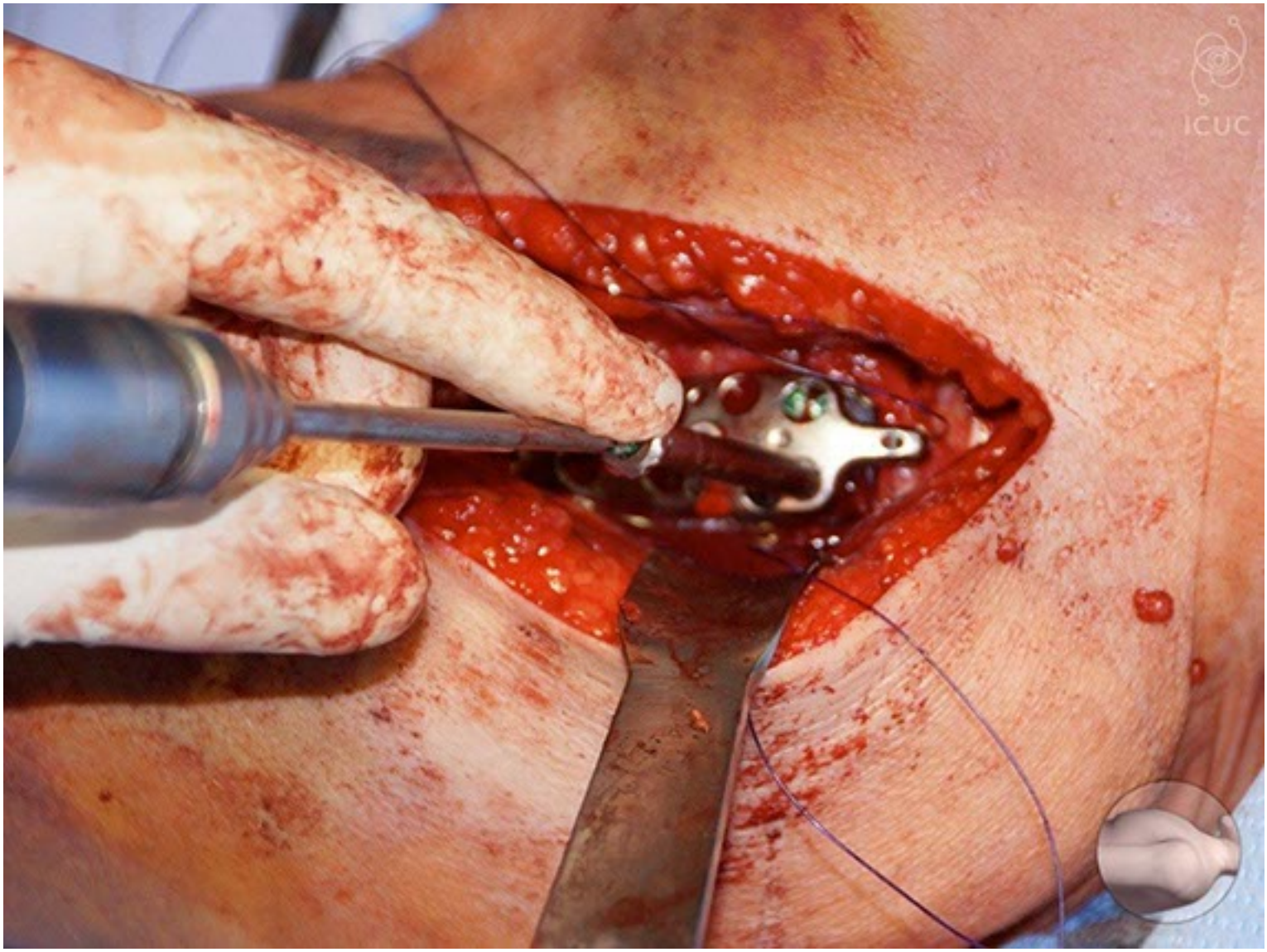
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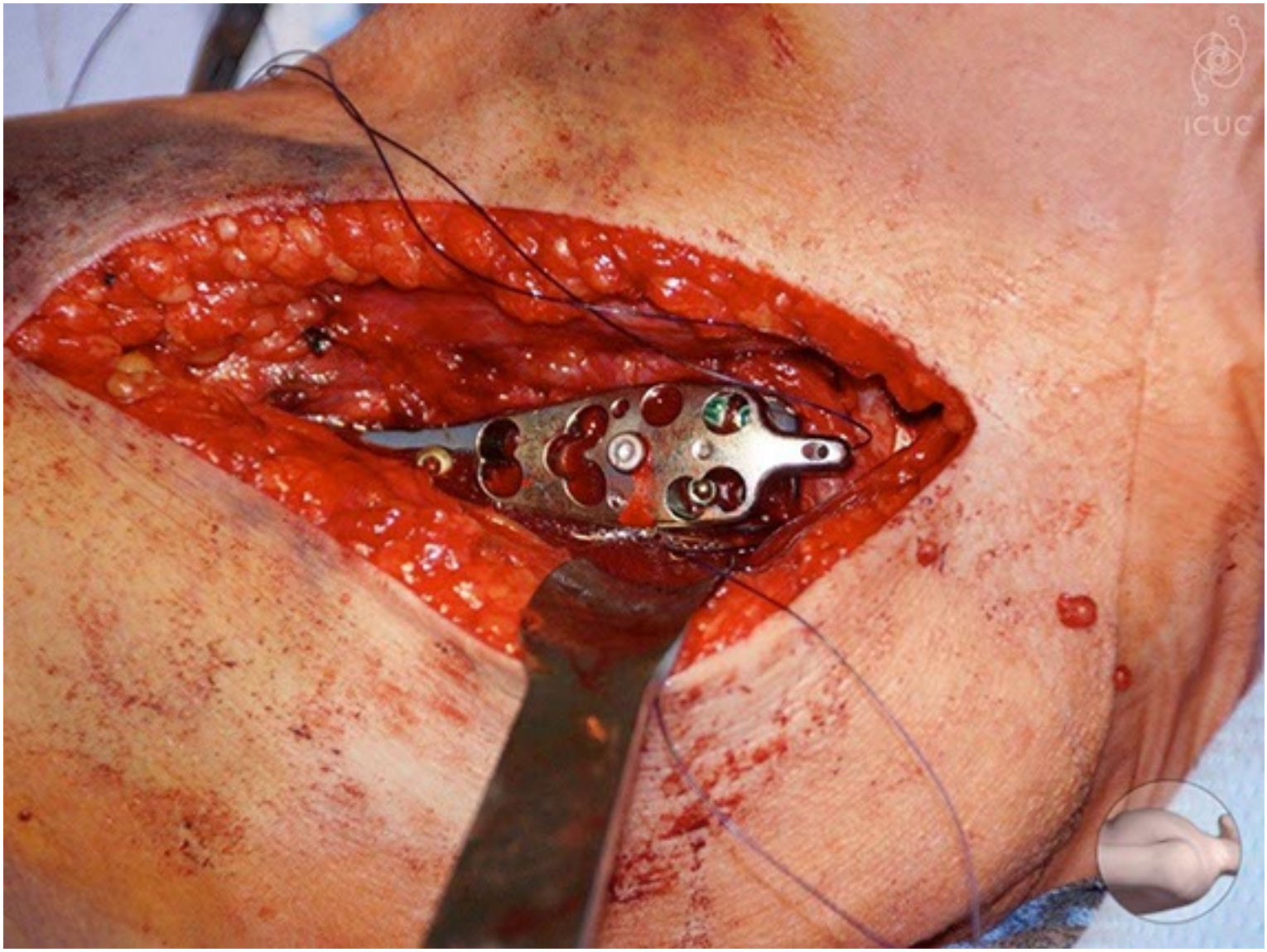


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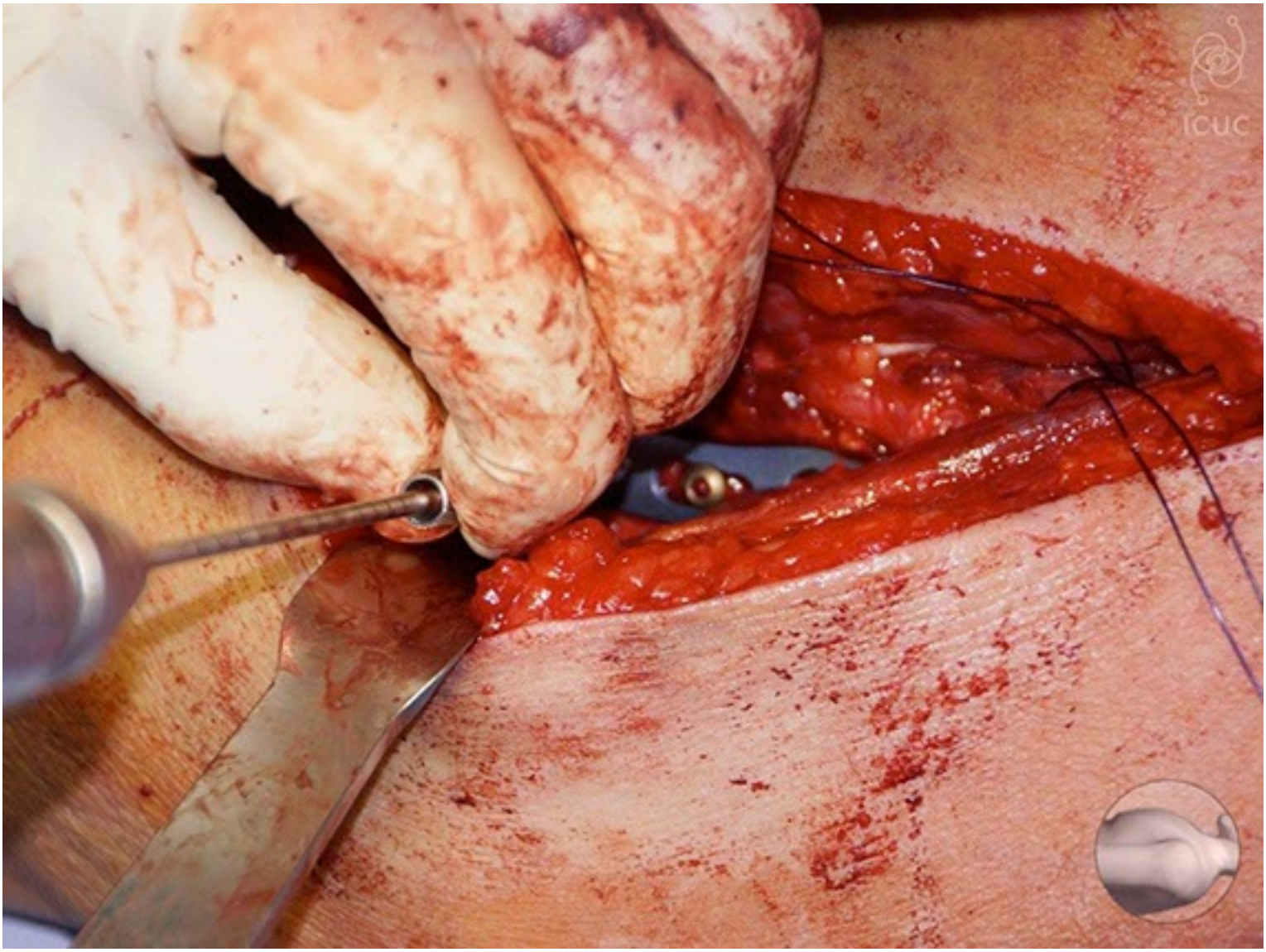

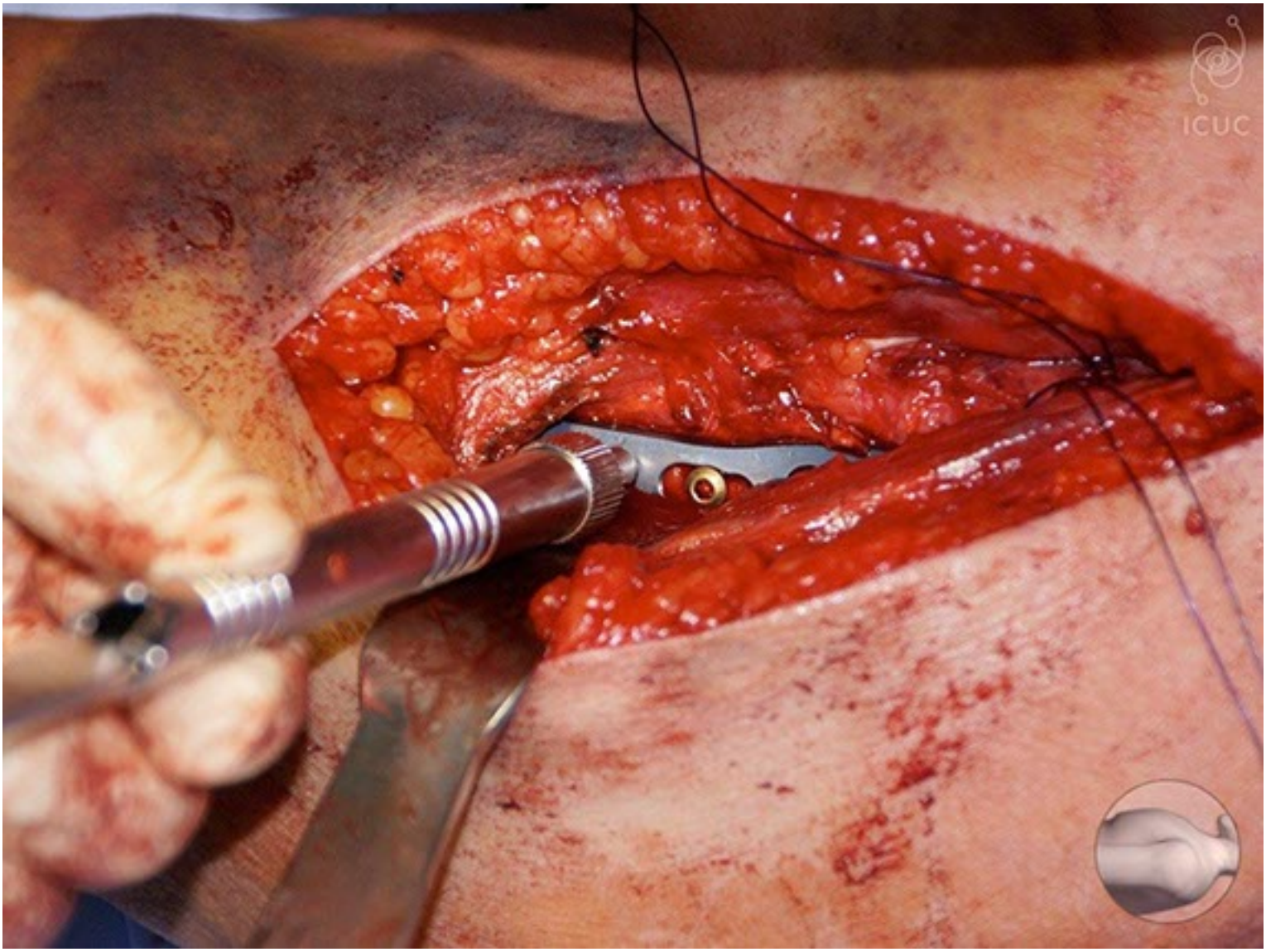
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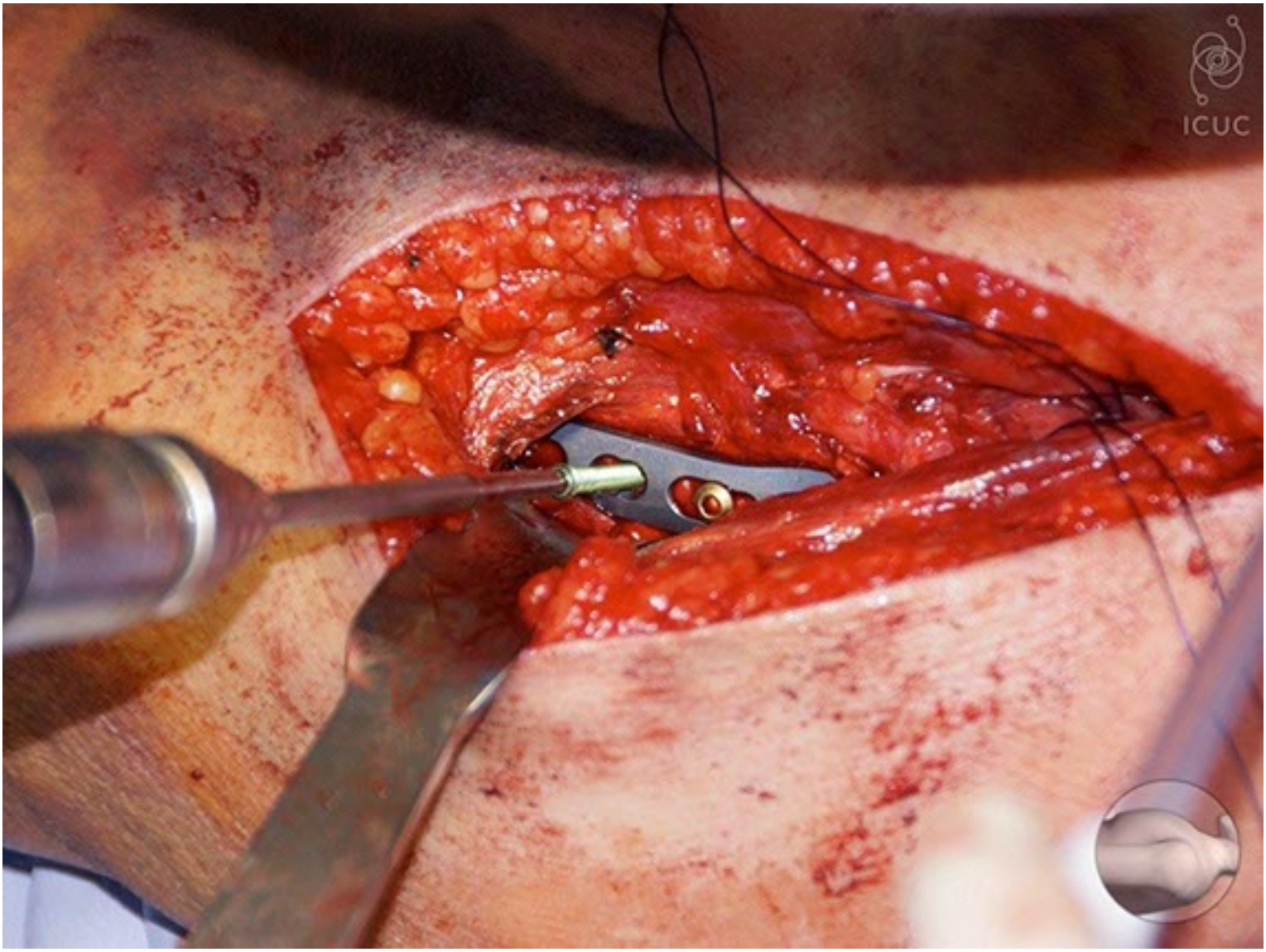
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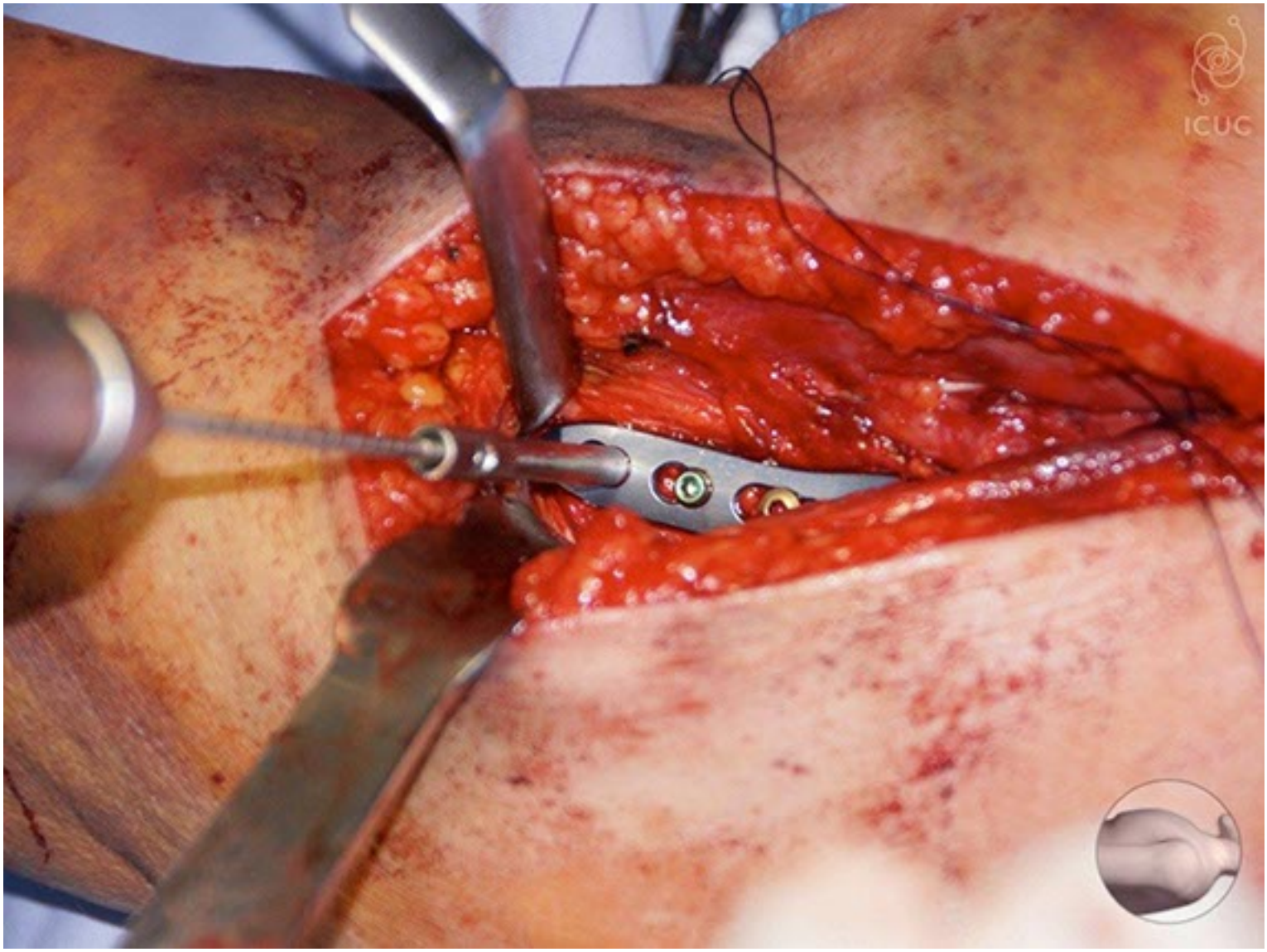
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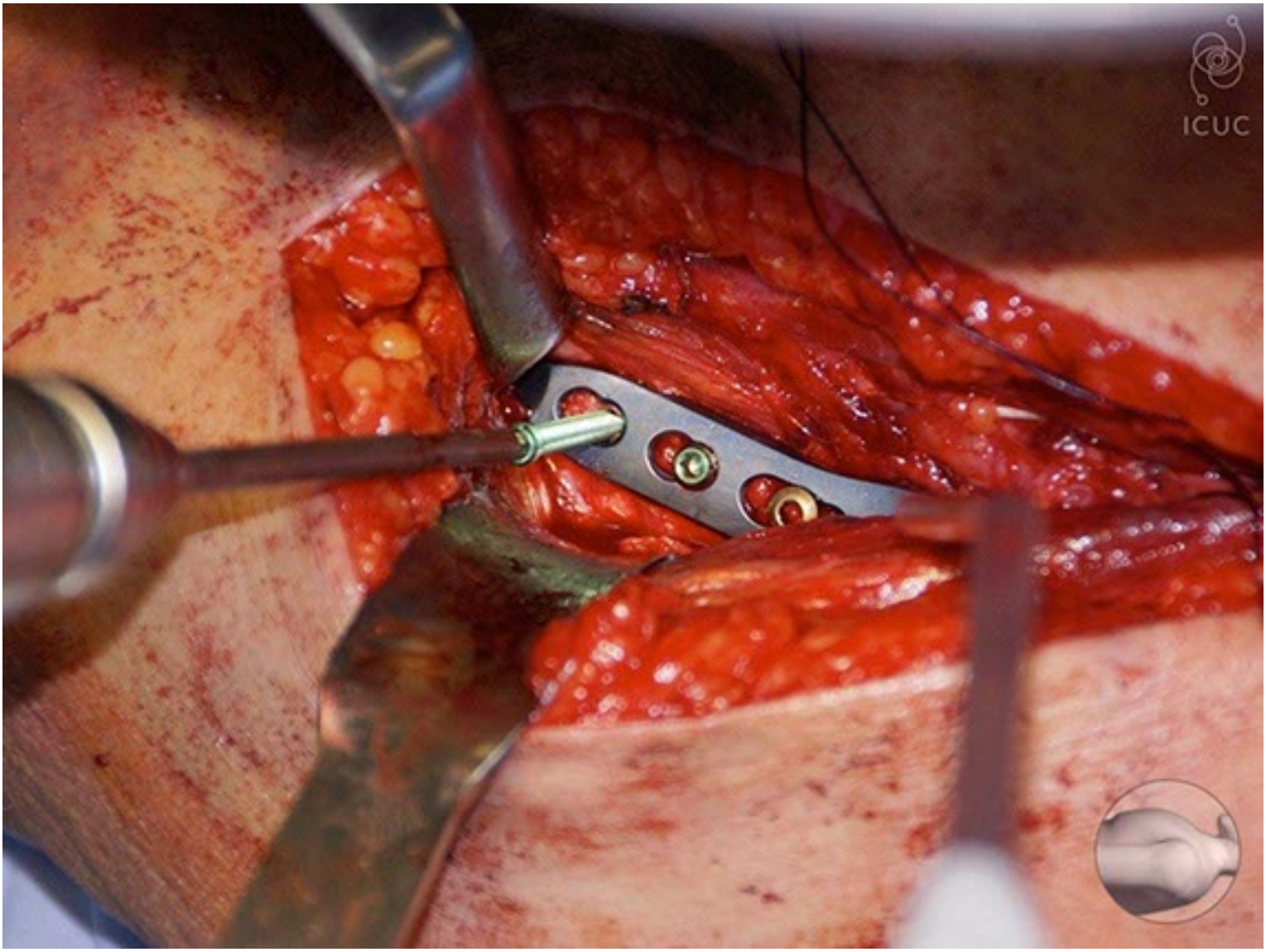
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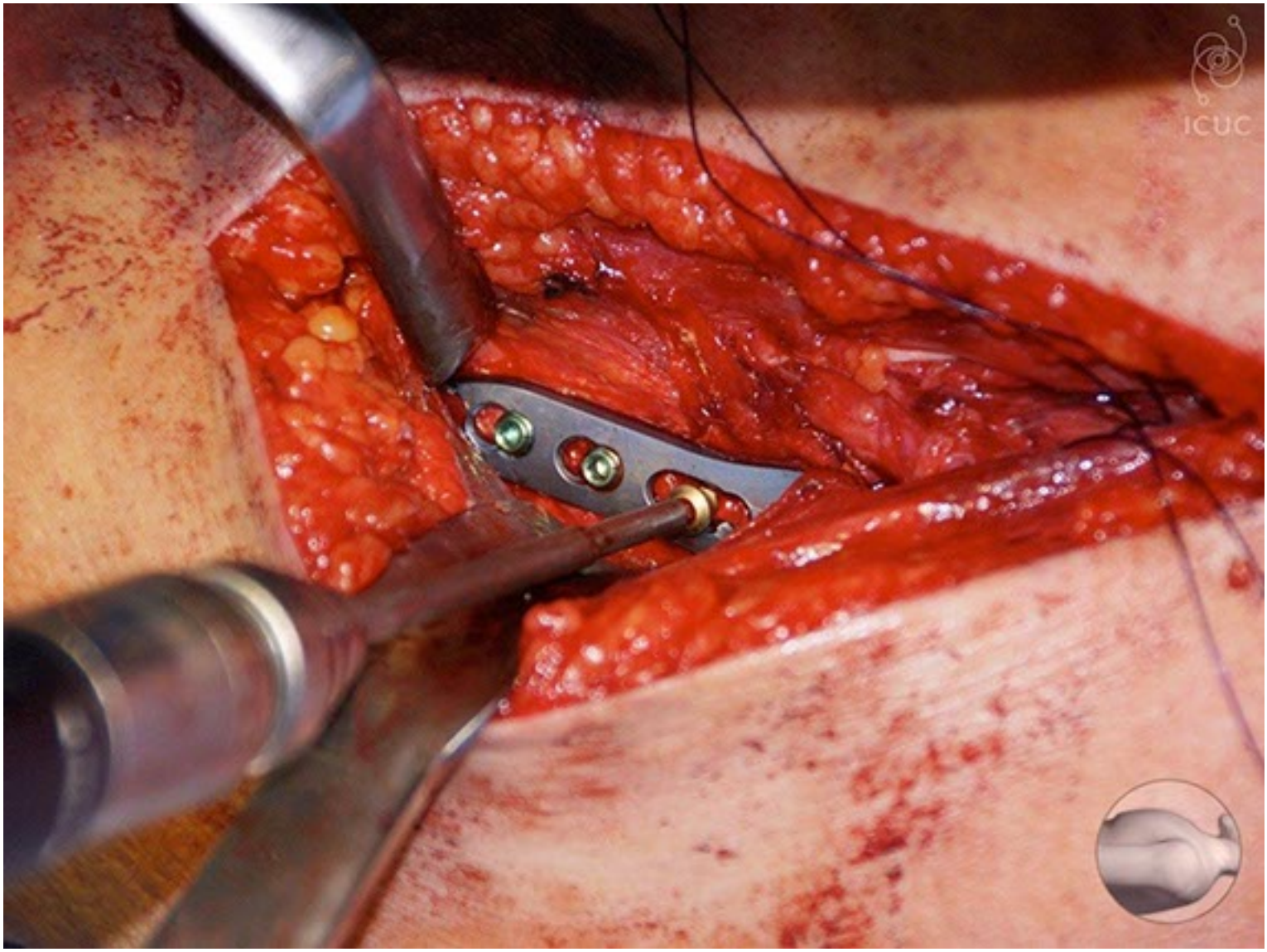
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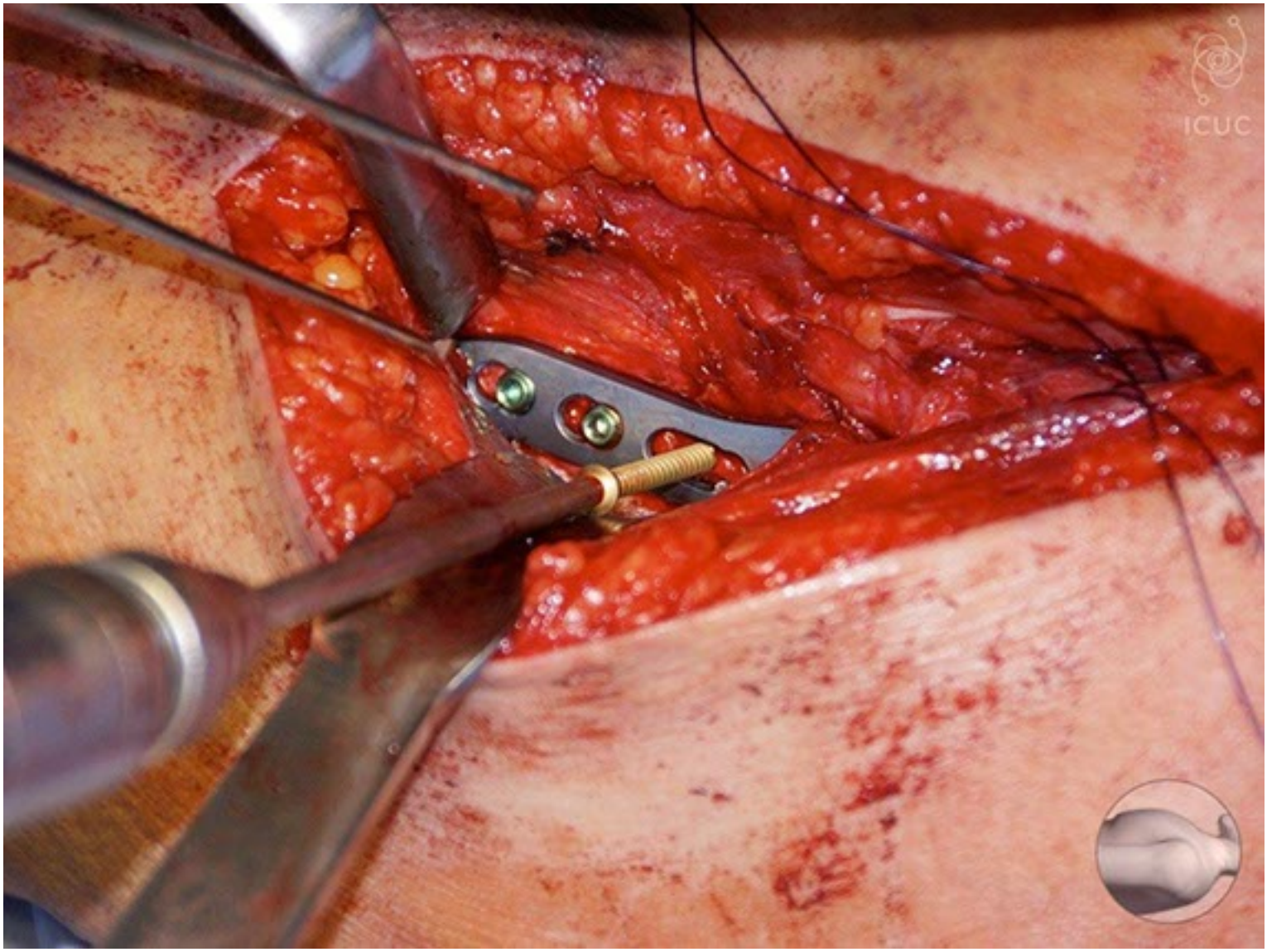
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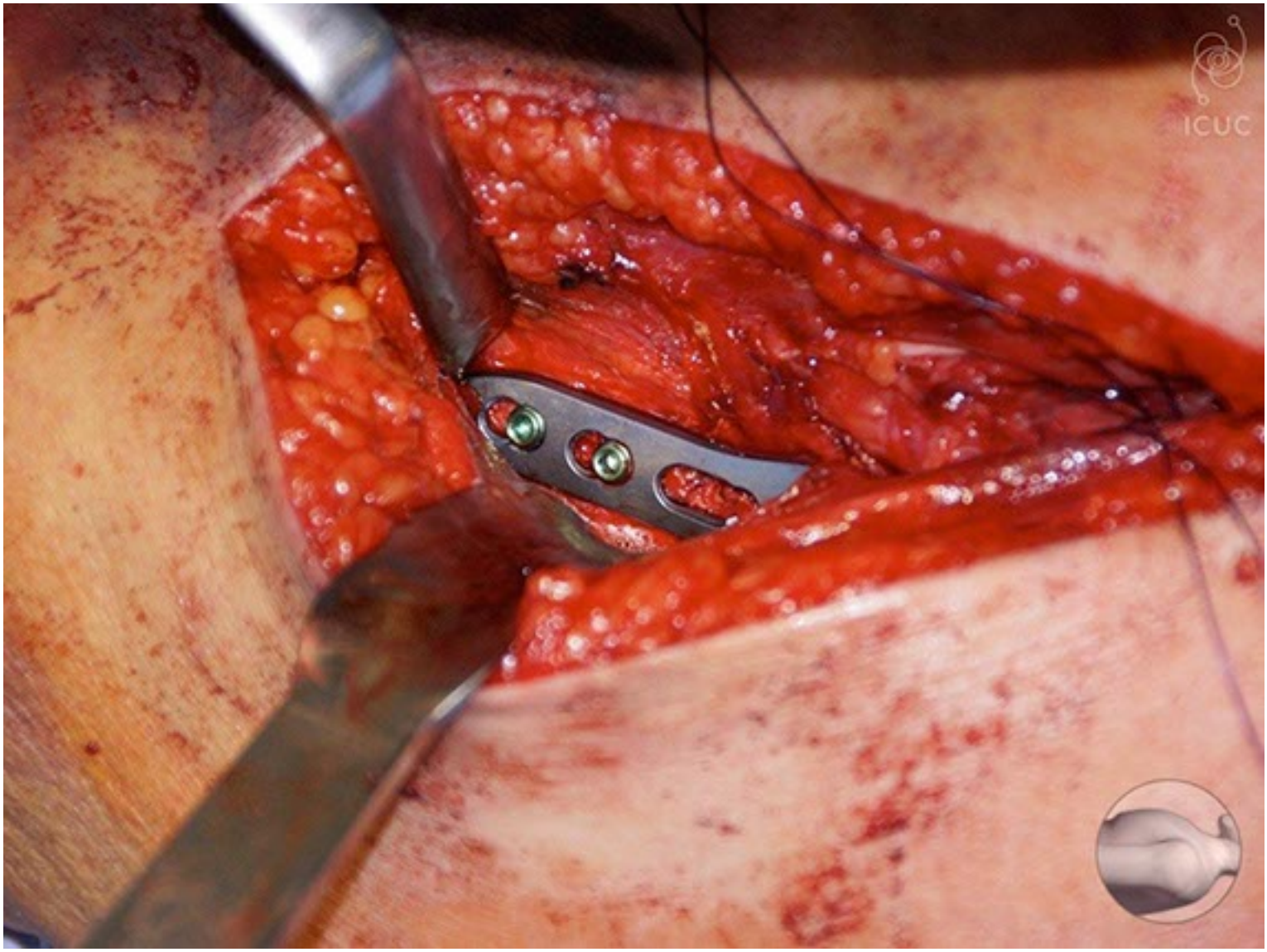
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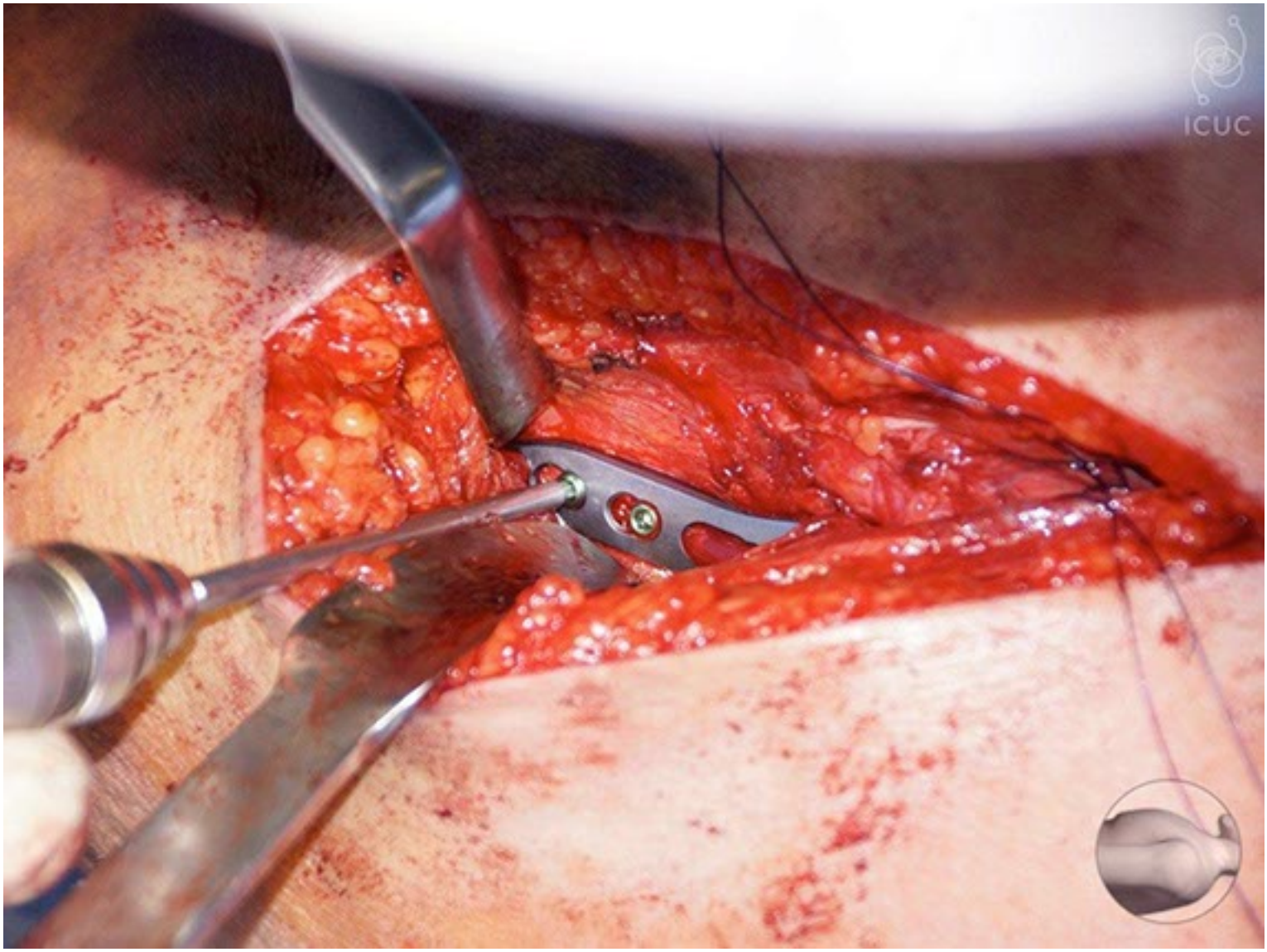
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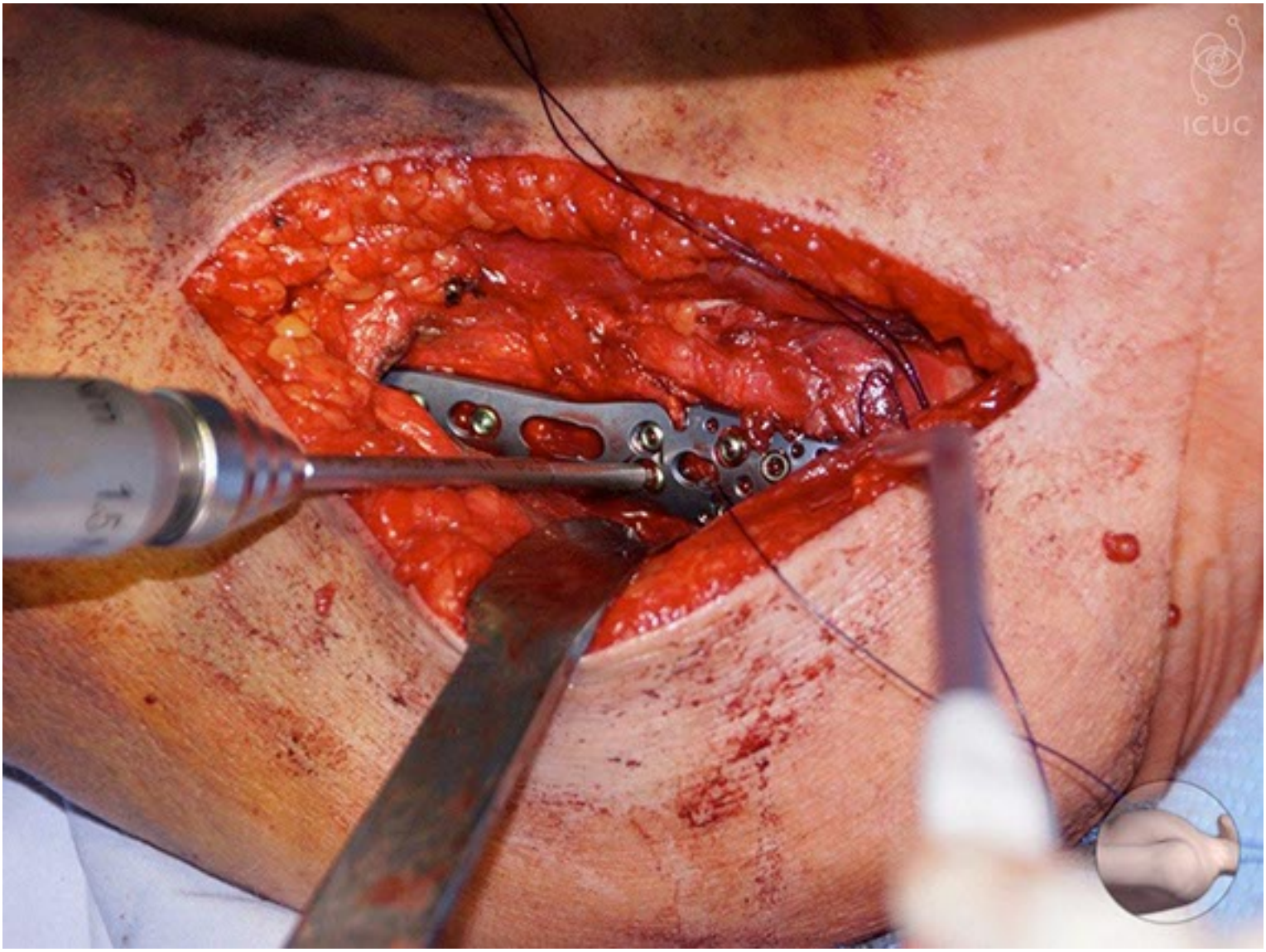
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ICUC


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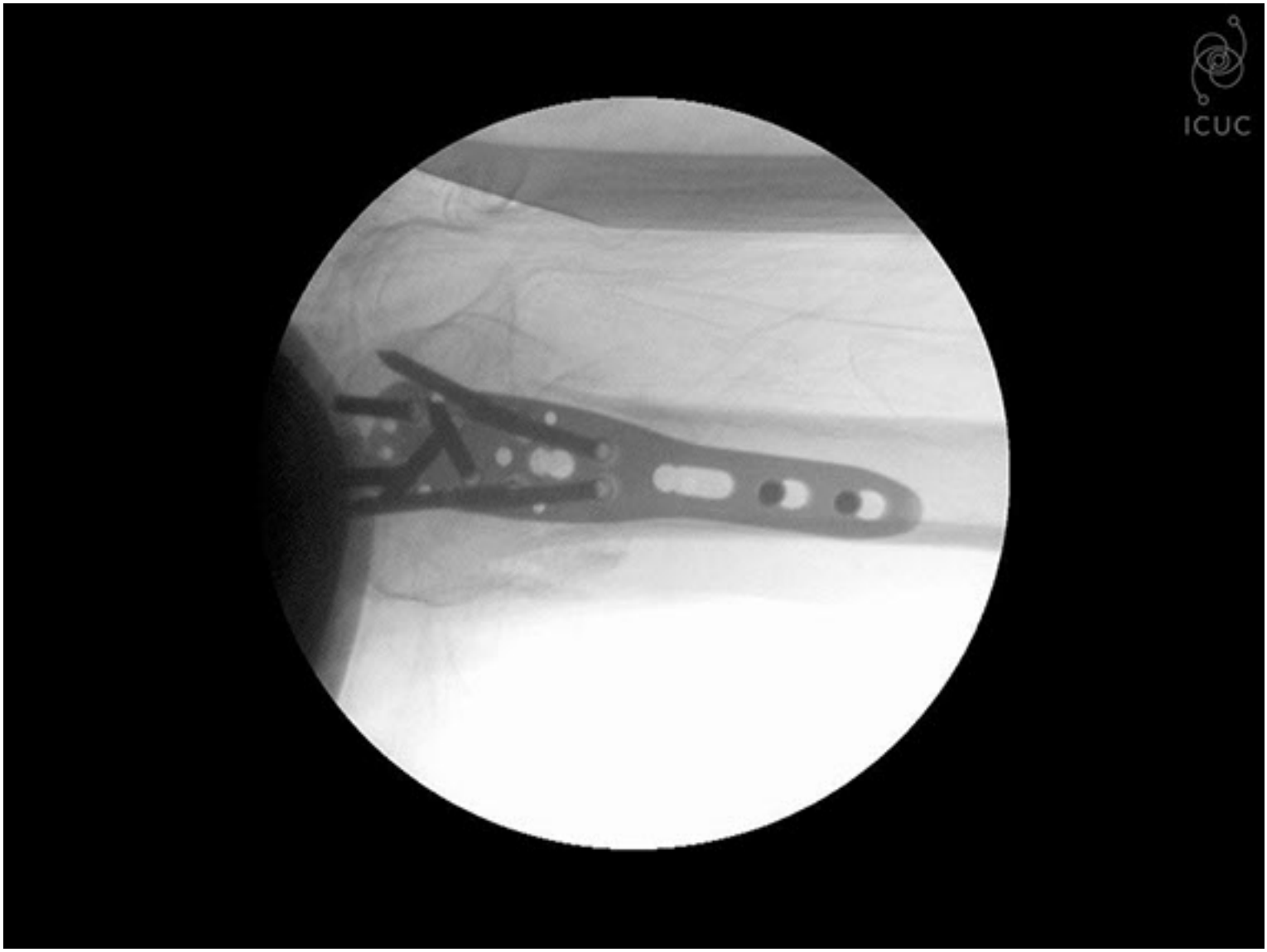
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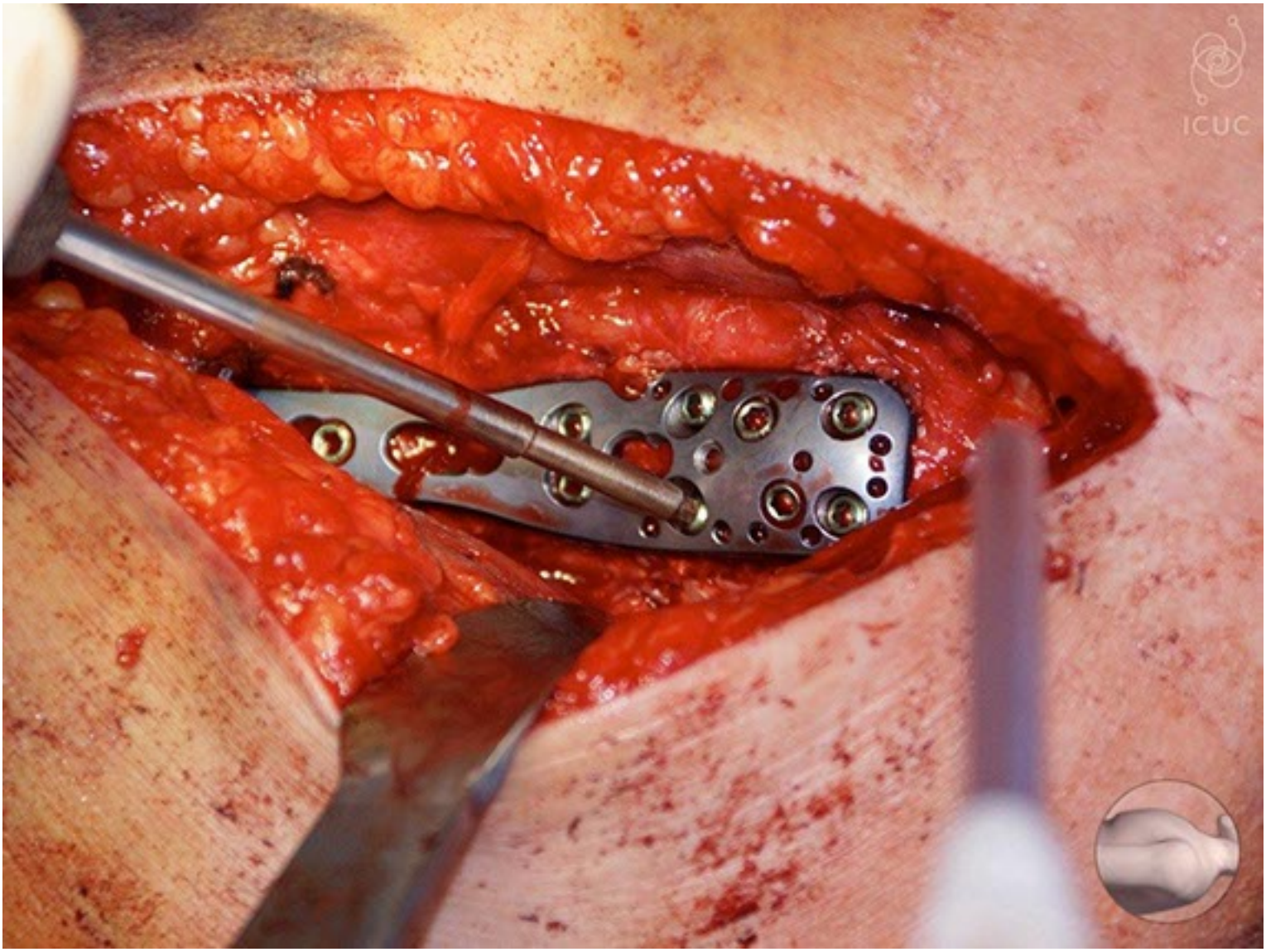
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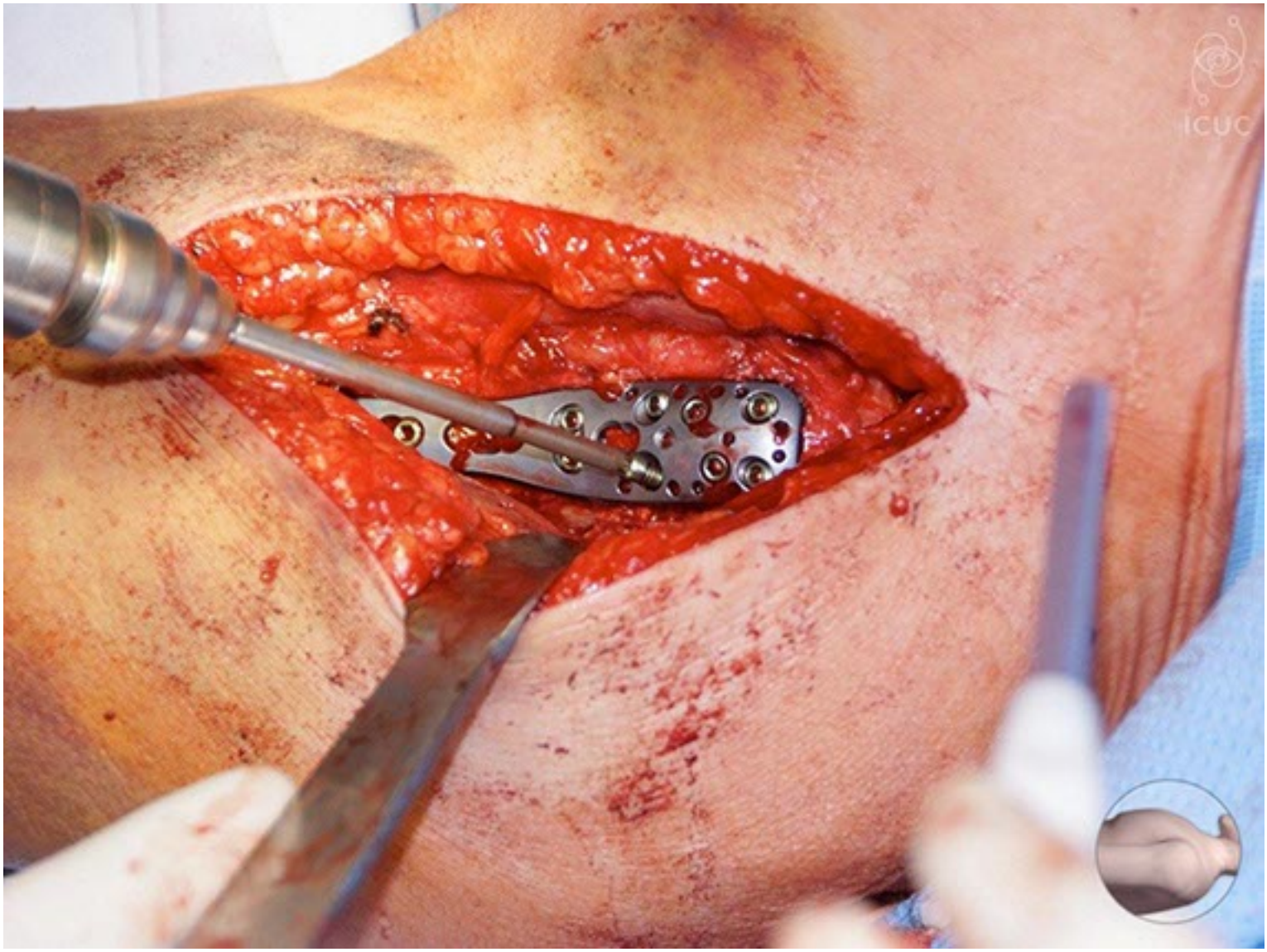

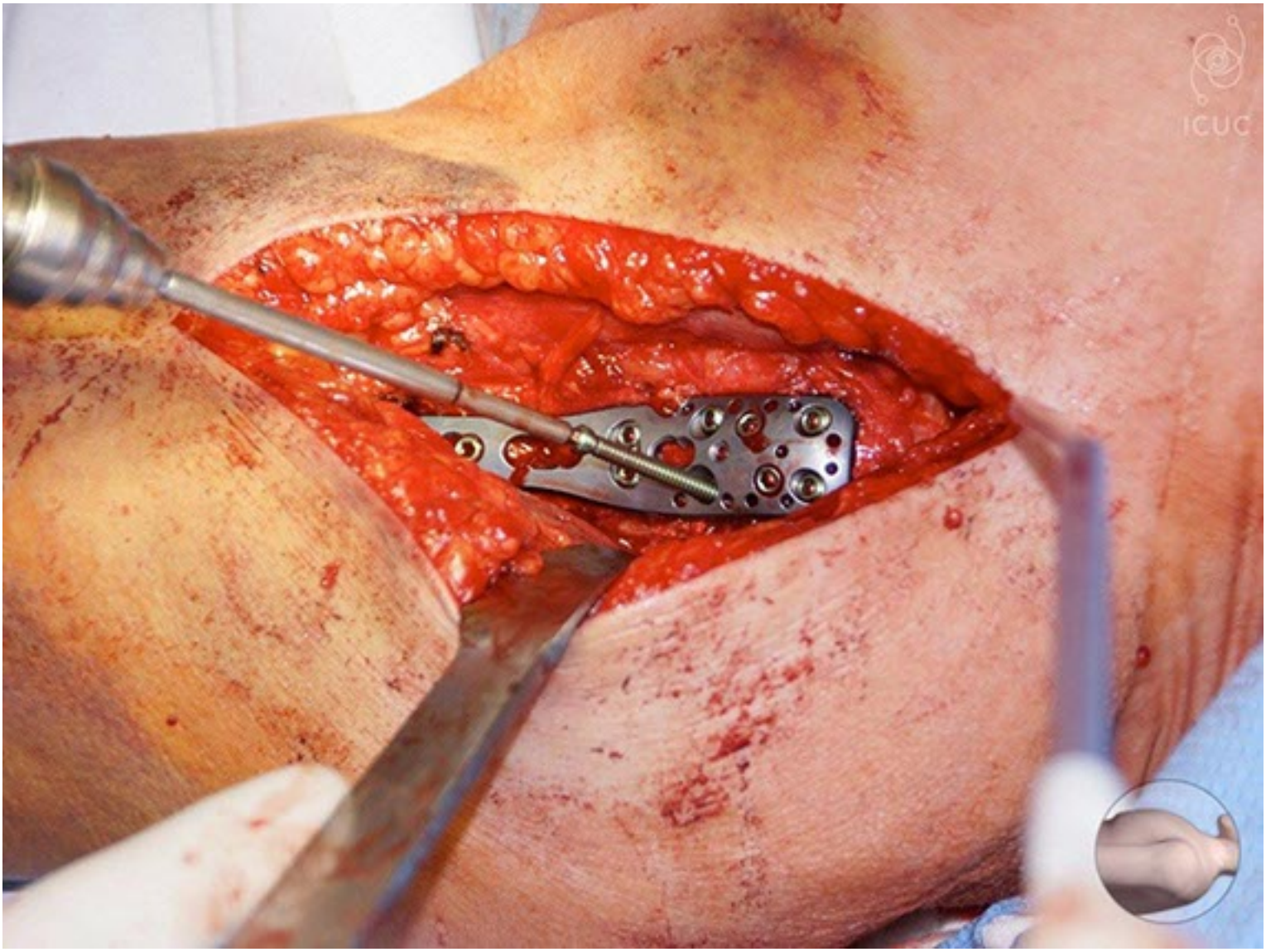
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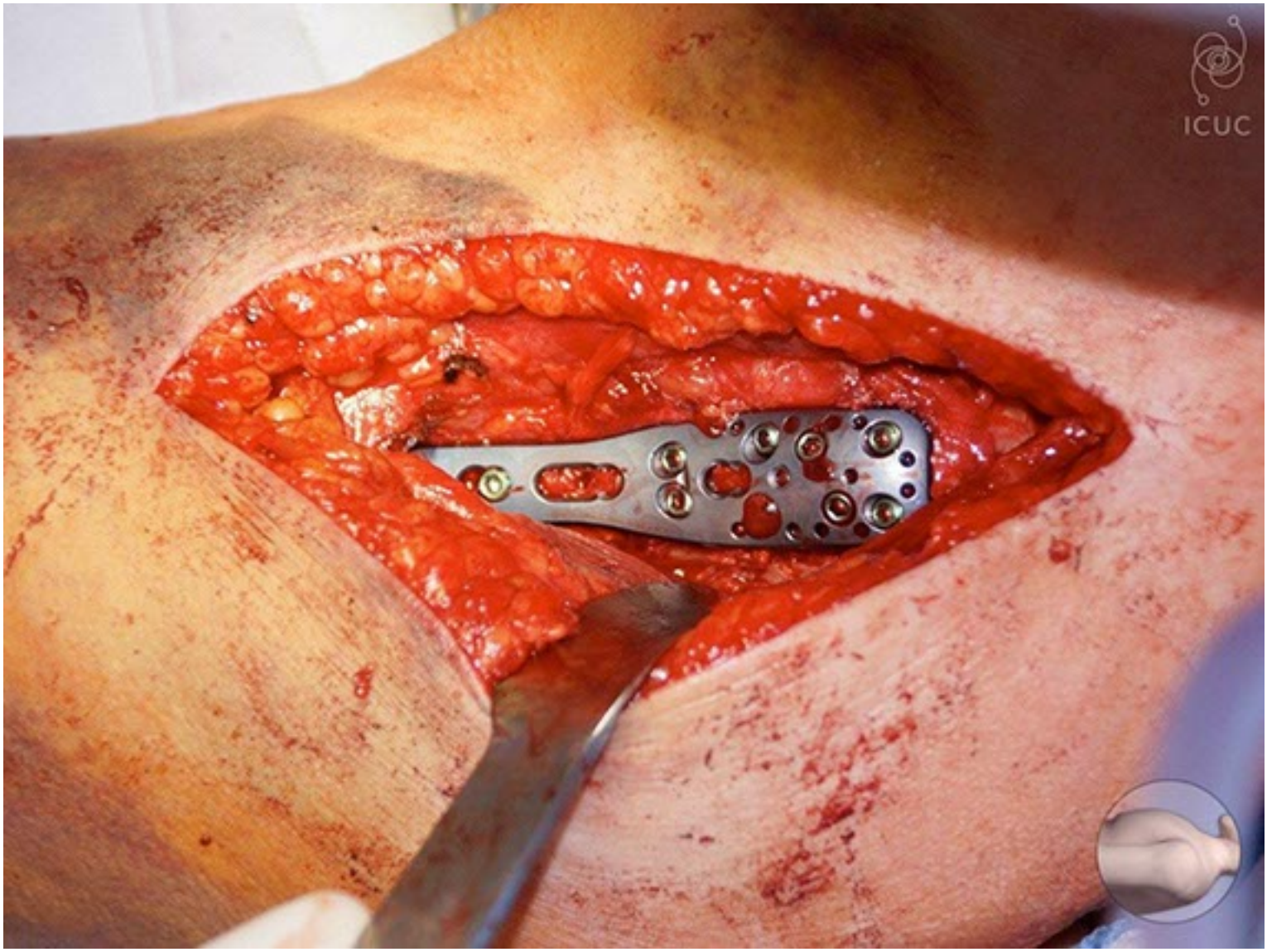
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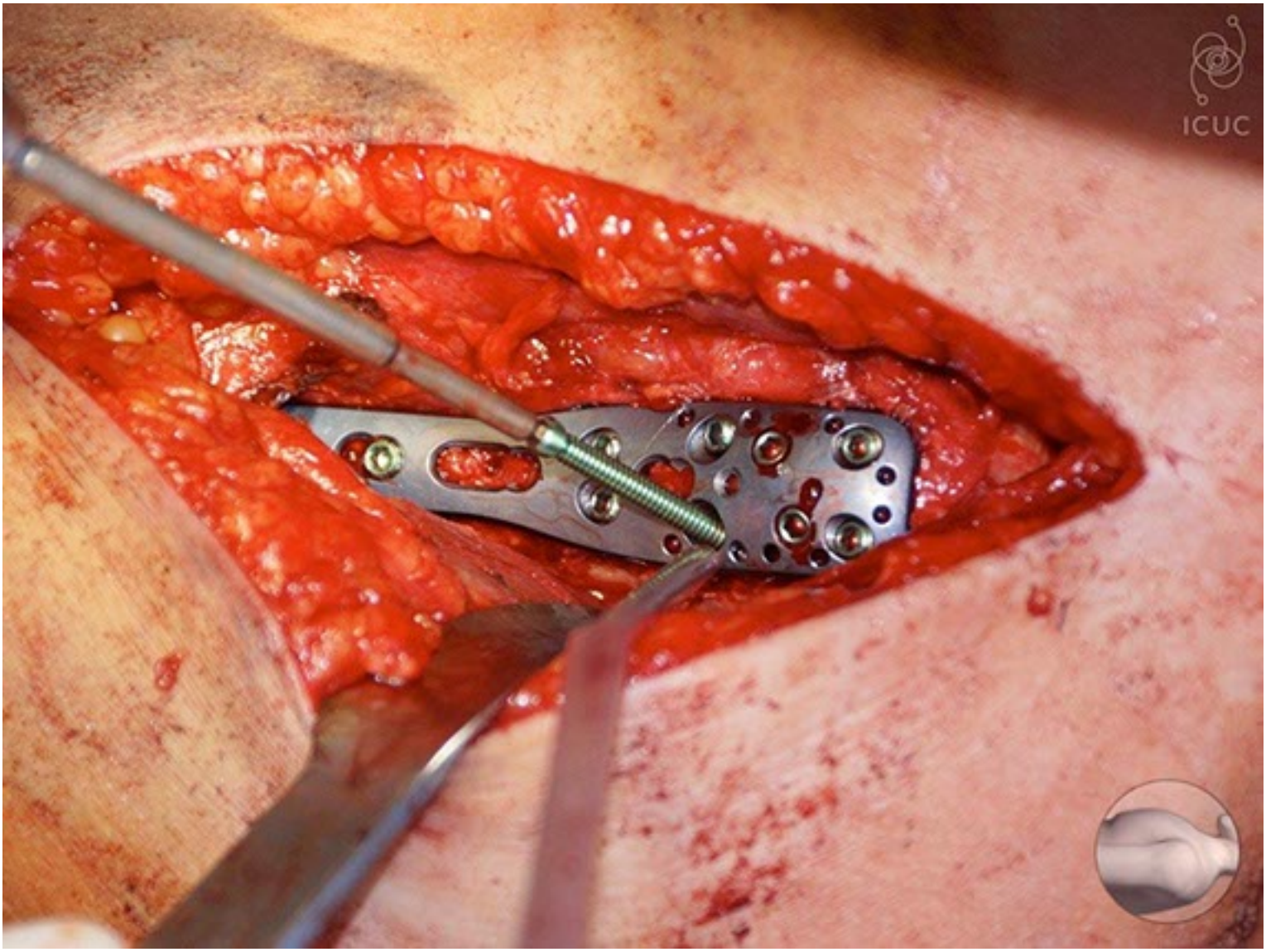
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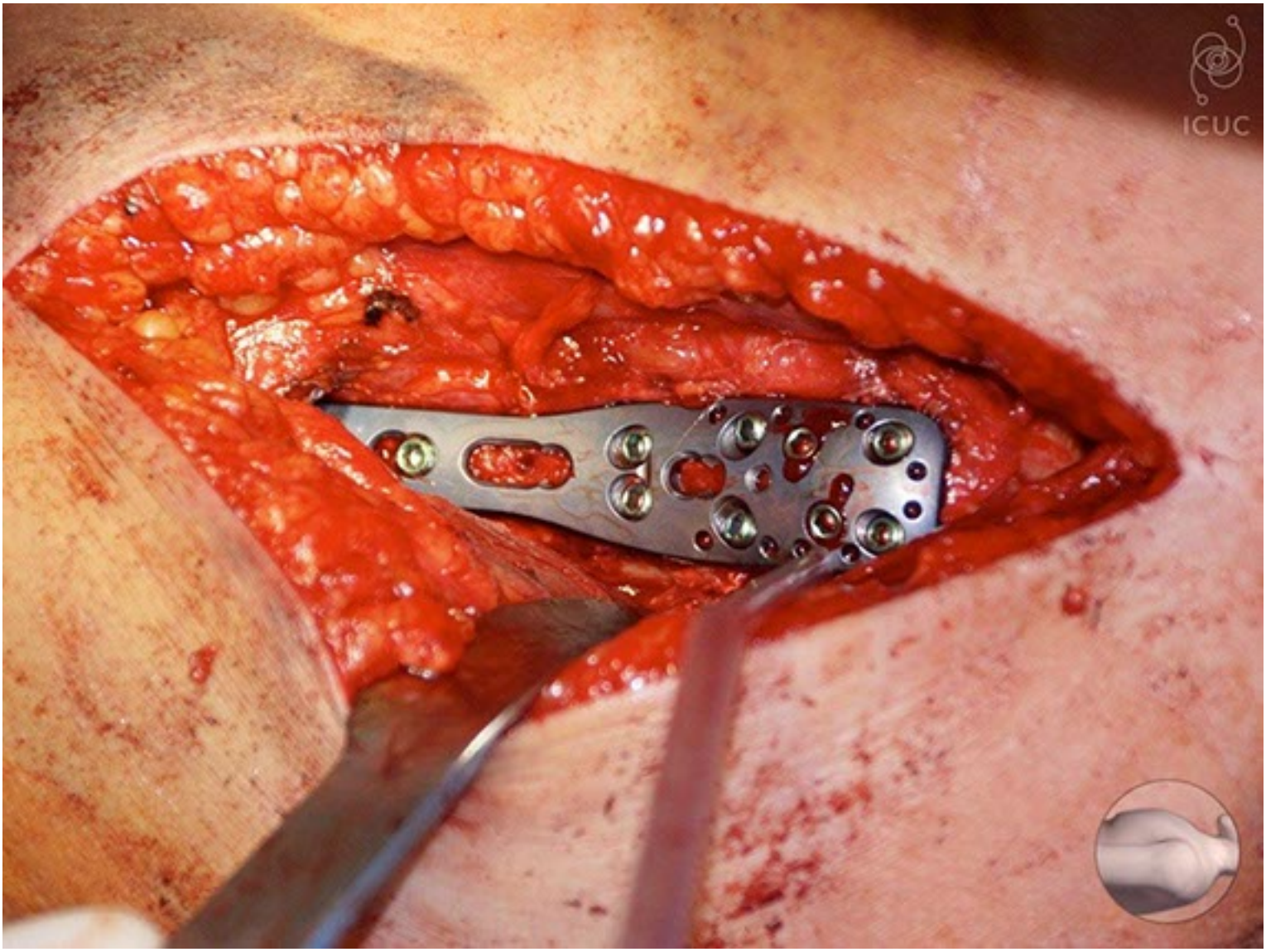
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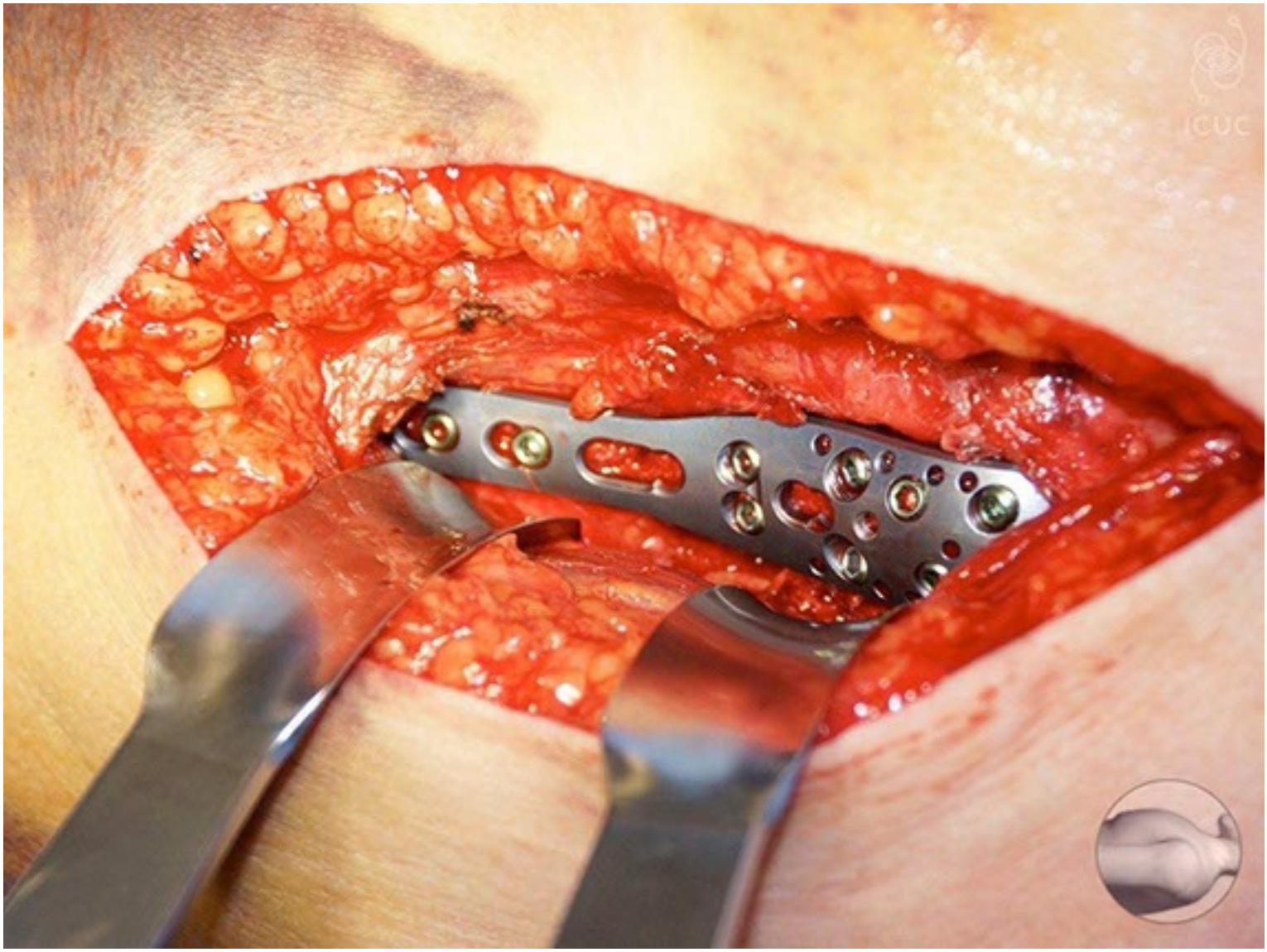

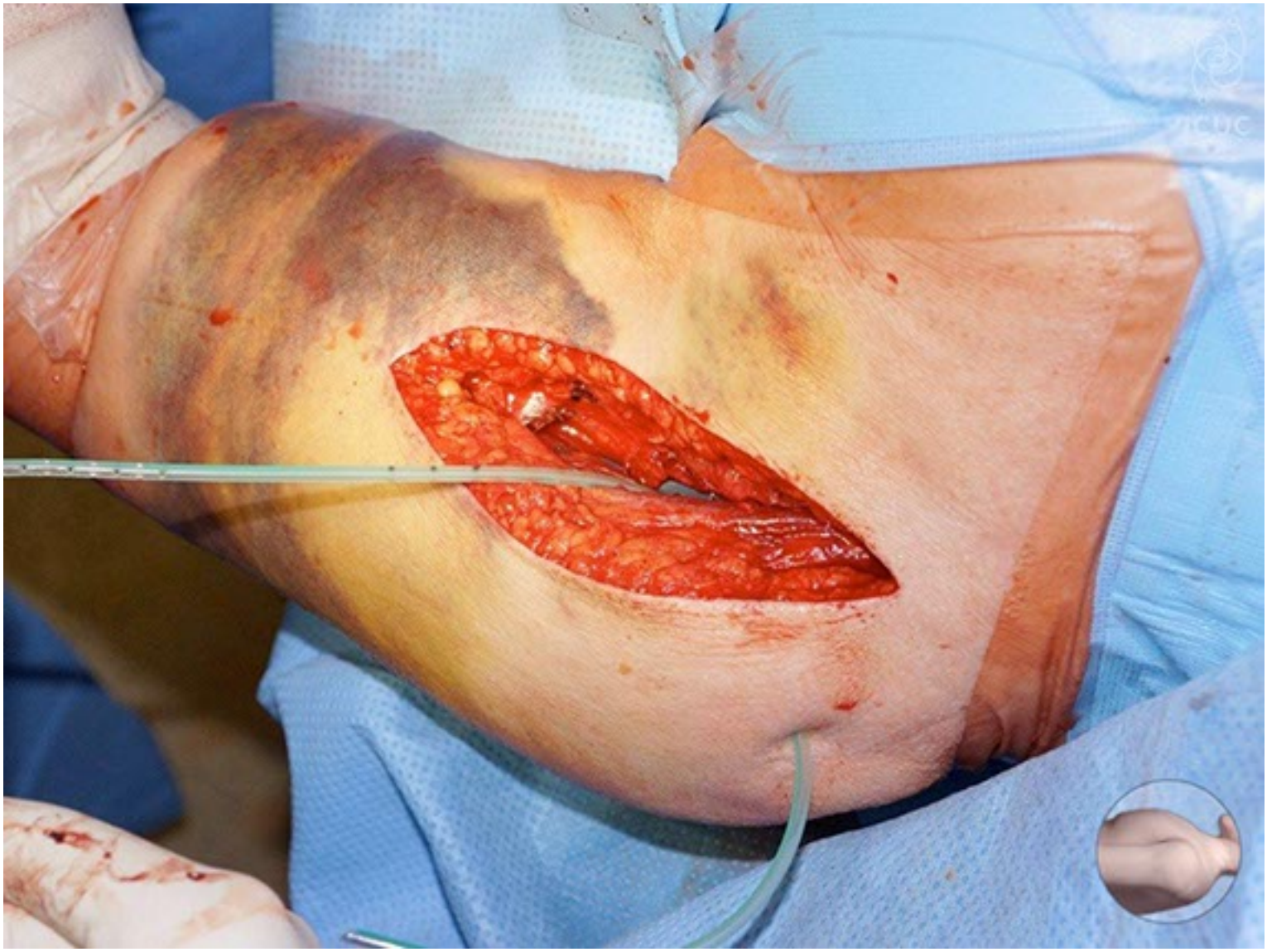

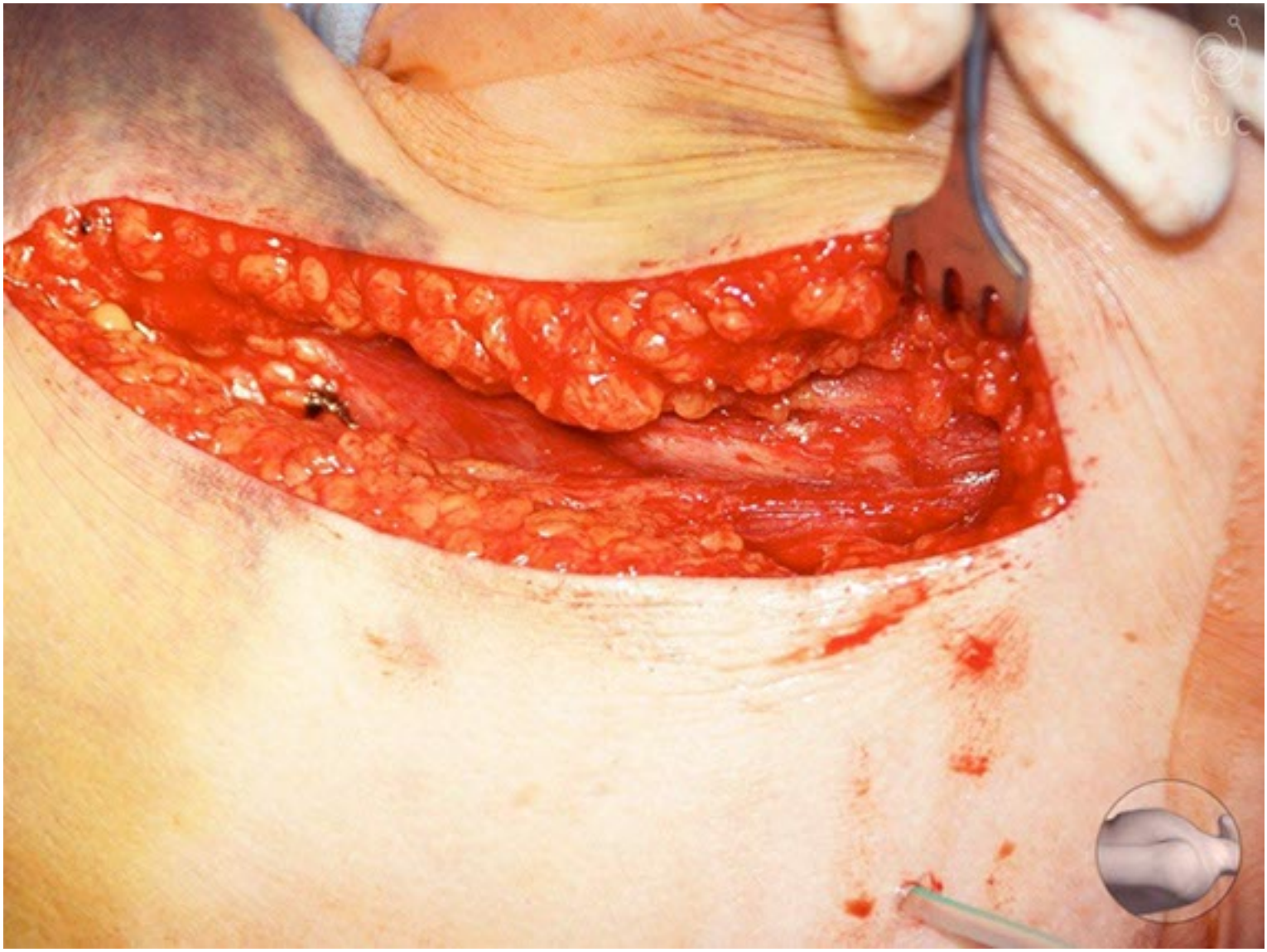

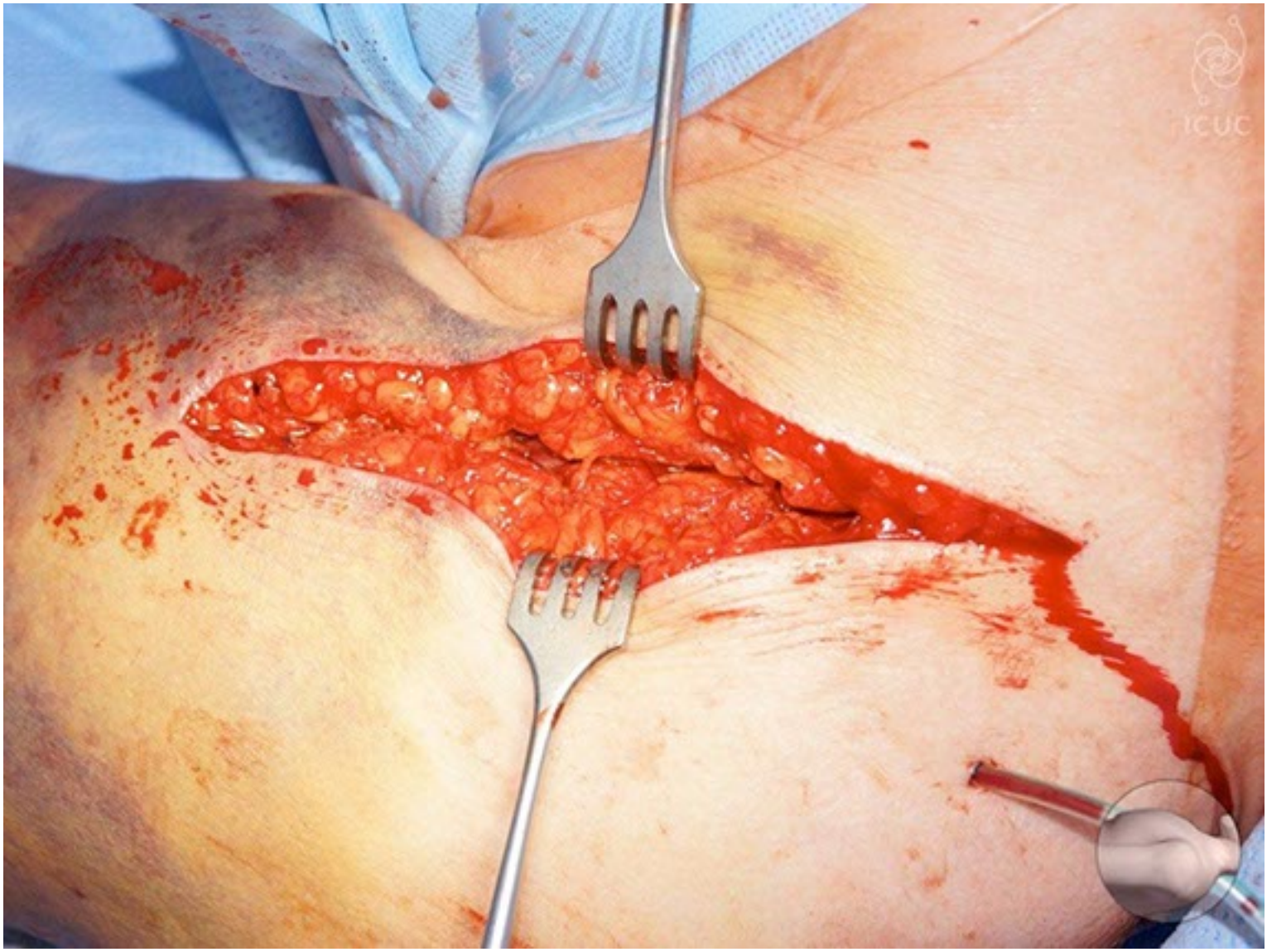


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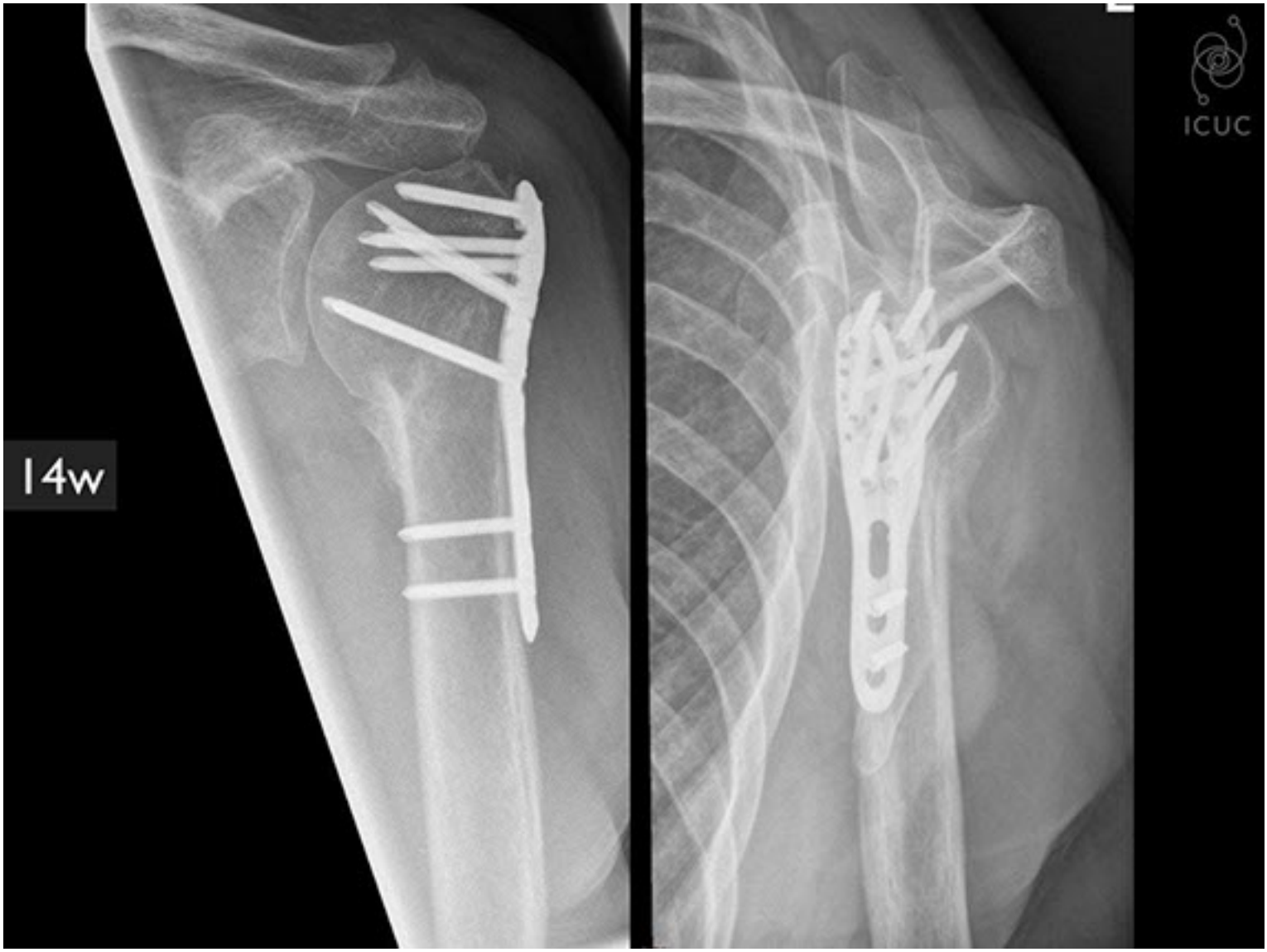
The plate could be placed a little bit lower
so that the calcar screws are also lower
and A screws slightly longer.
Typically, they should be 40 mm long
and this seems less.

There is still varus;
the lateral column of the proximal humerus
is not really flush against the plate.
In a really anatomic reduction,
the humerus would be flush against the plate.
Therefore, the shape of the plate
is a control for reduction as well.
The medial comminution
does not bother me very much.

They removed the bicortical screw
and placed two locking screws at the shaft.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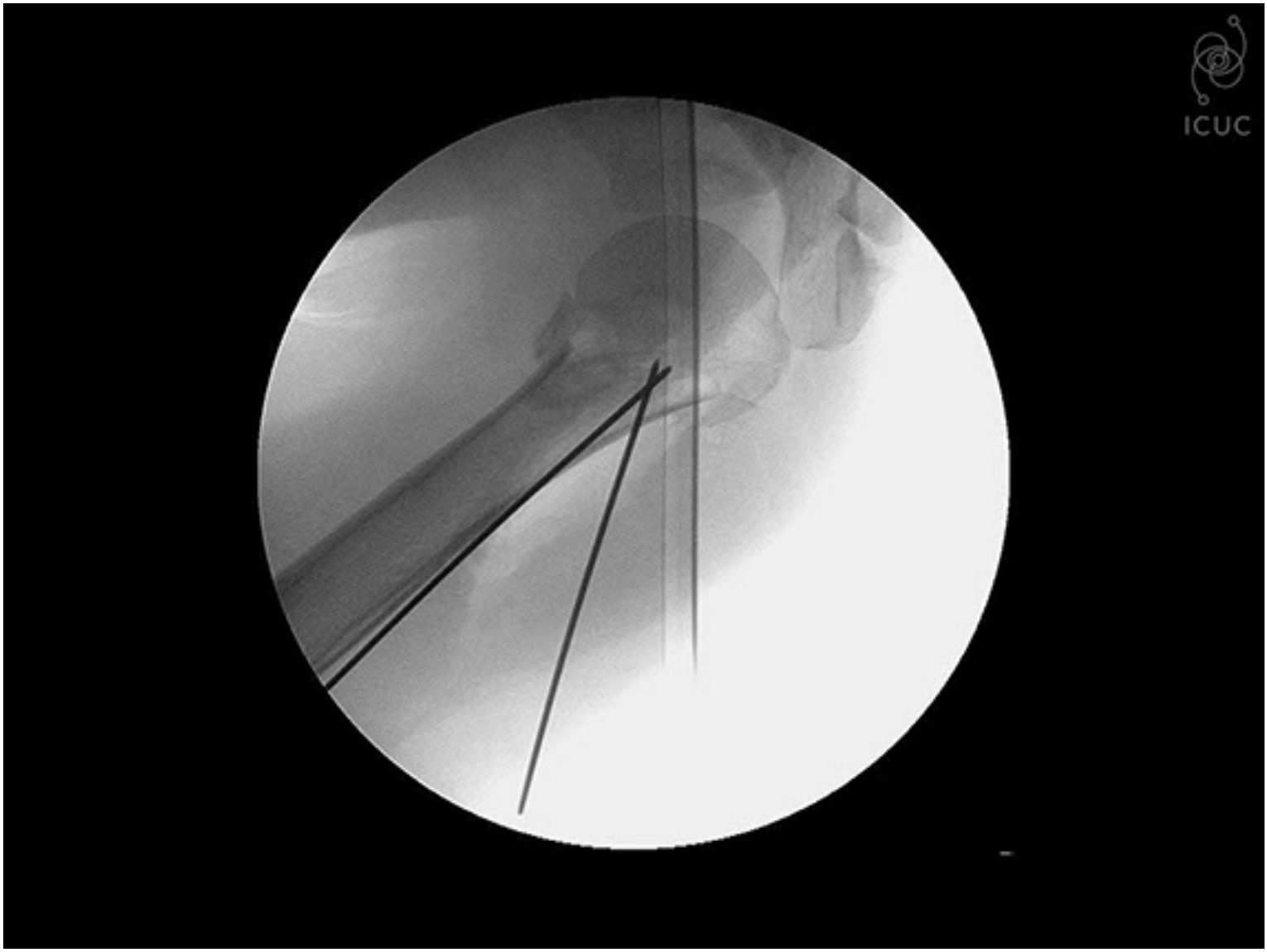
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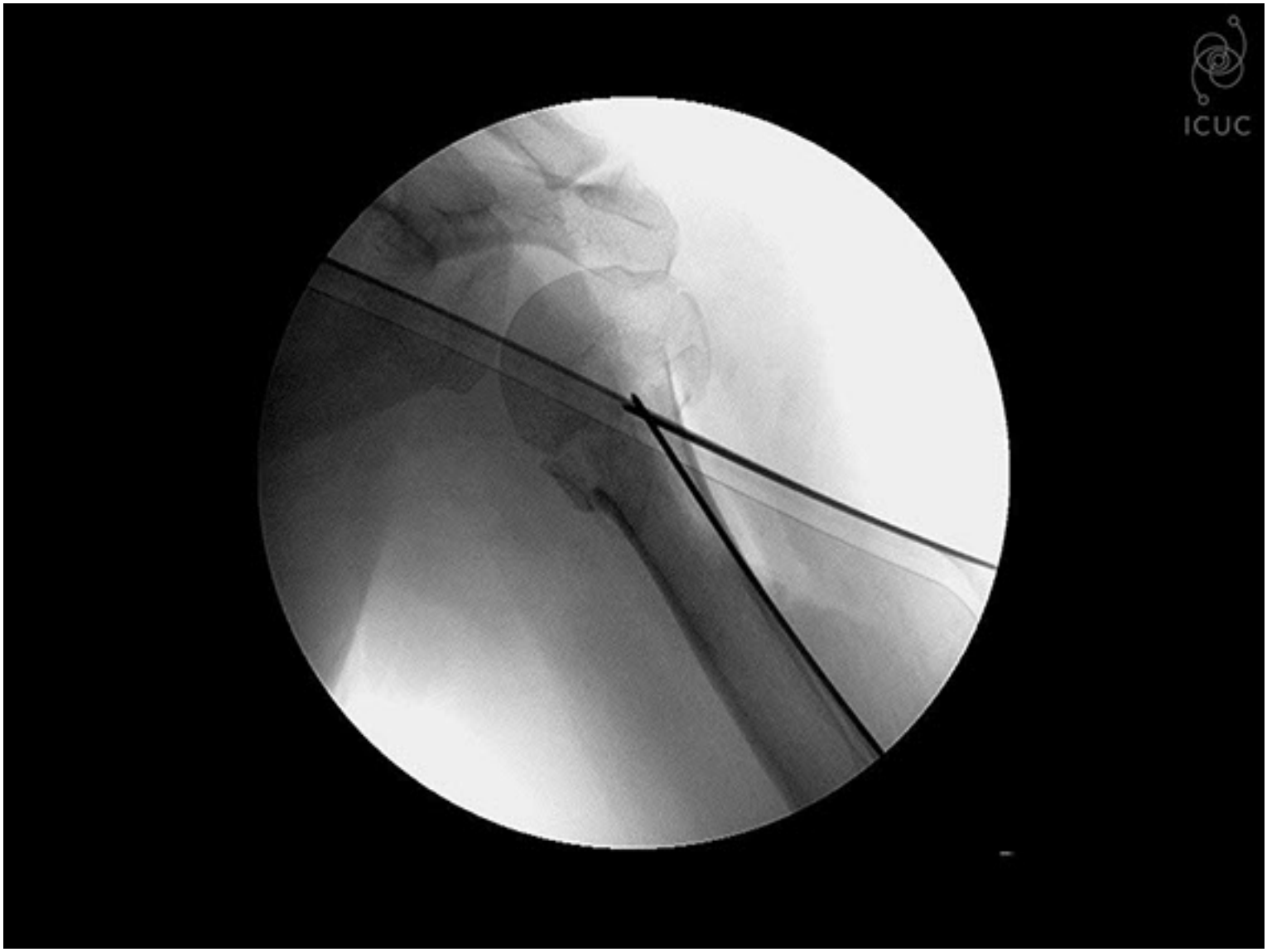
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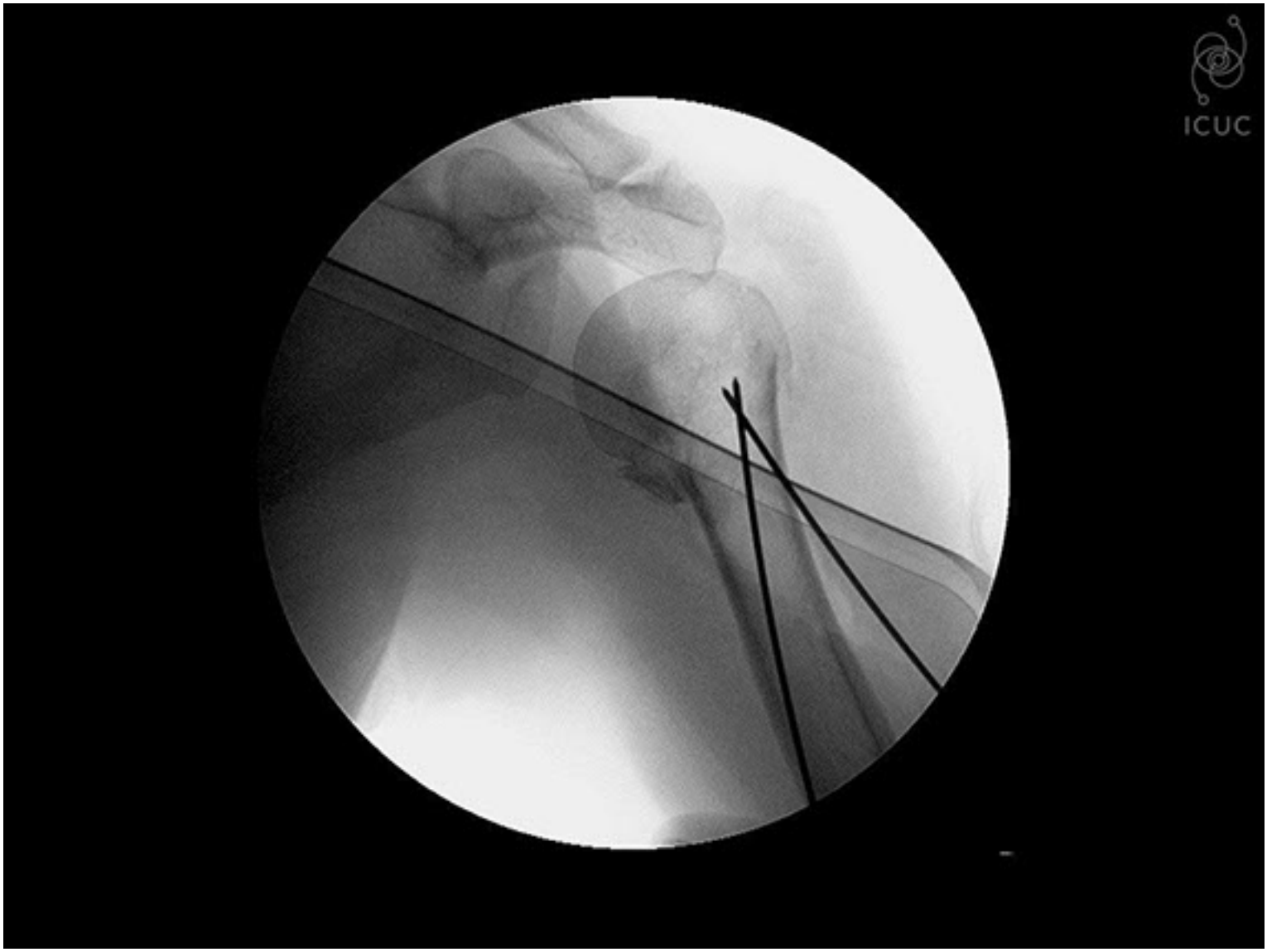
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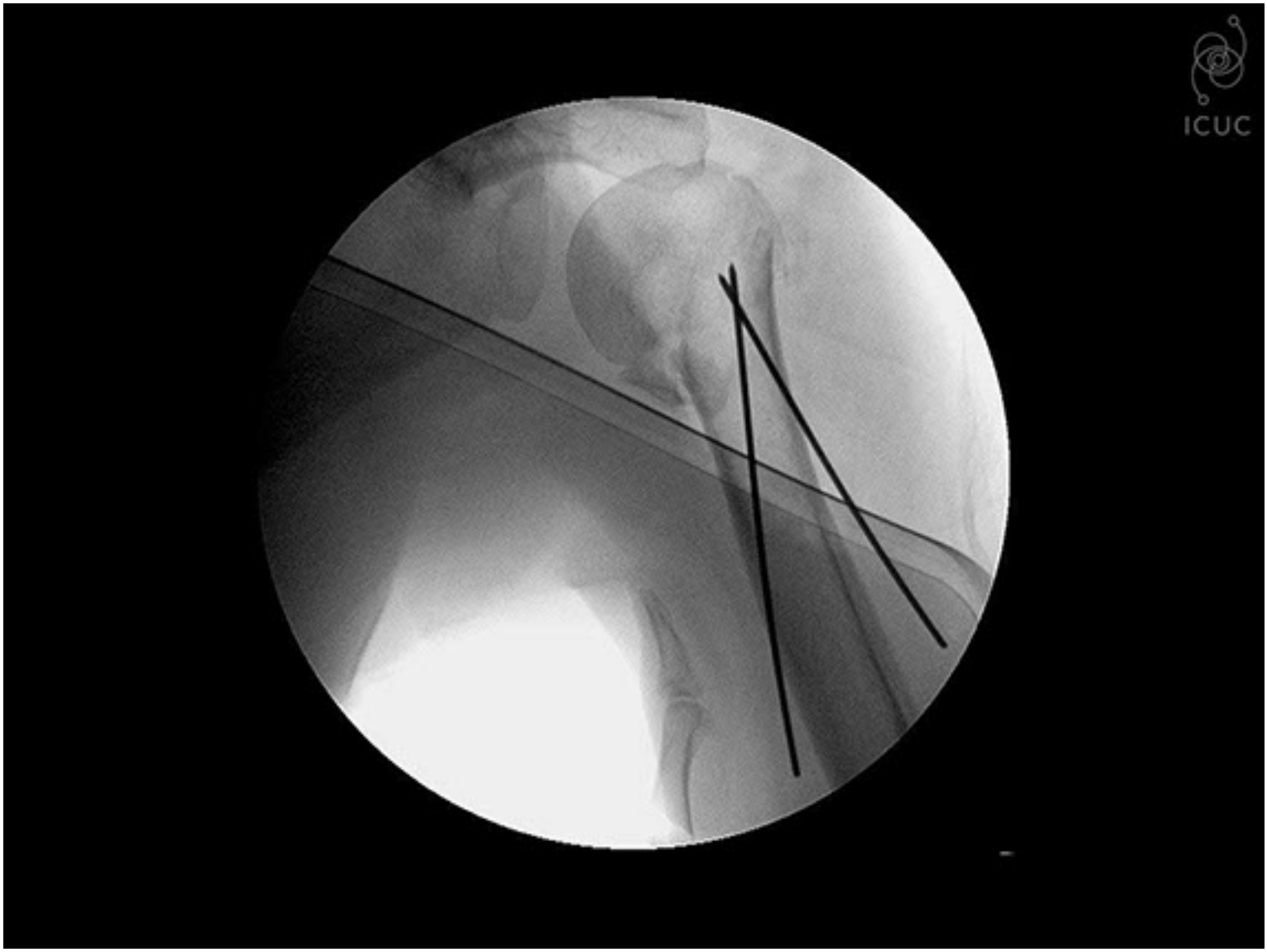
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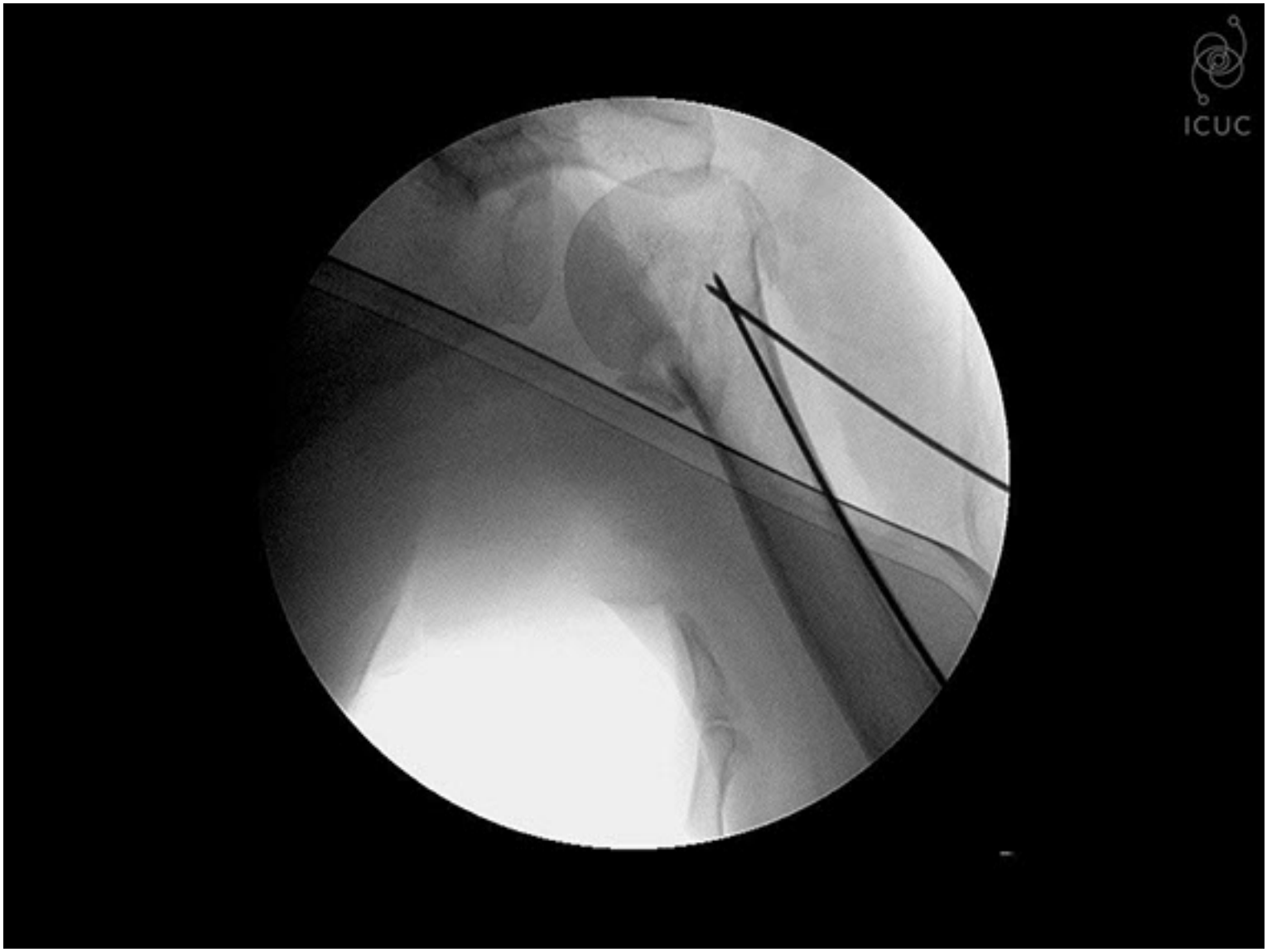
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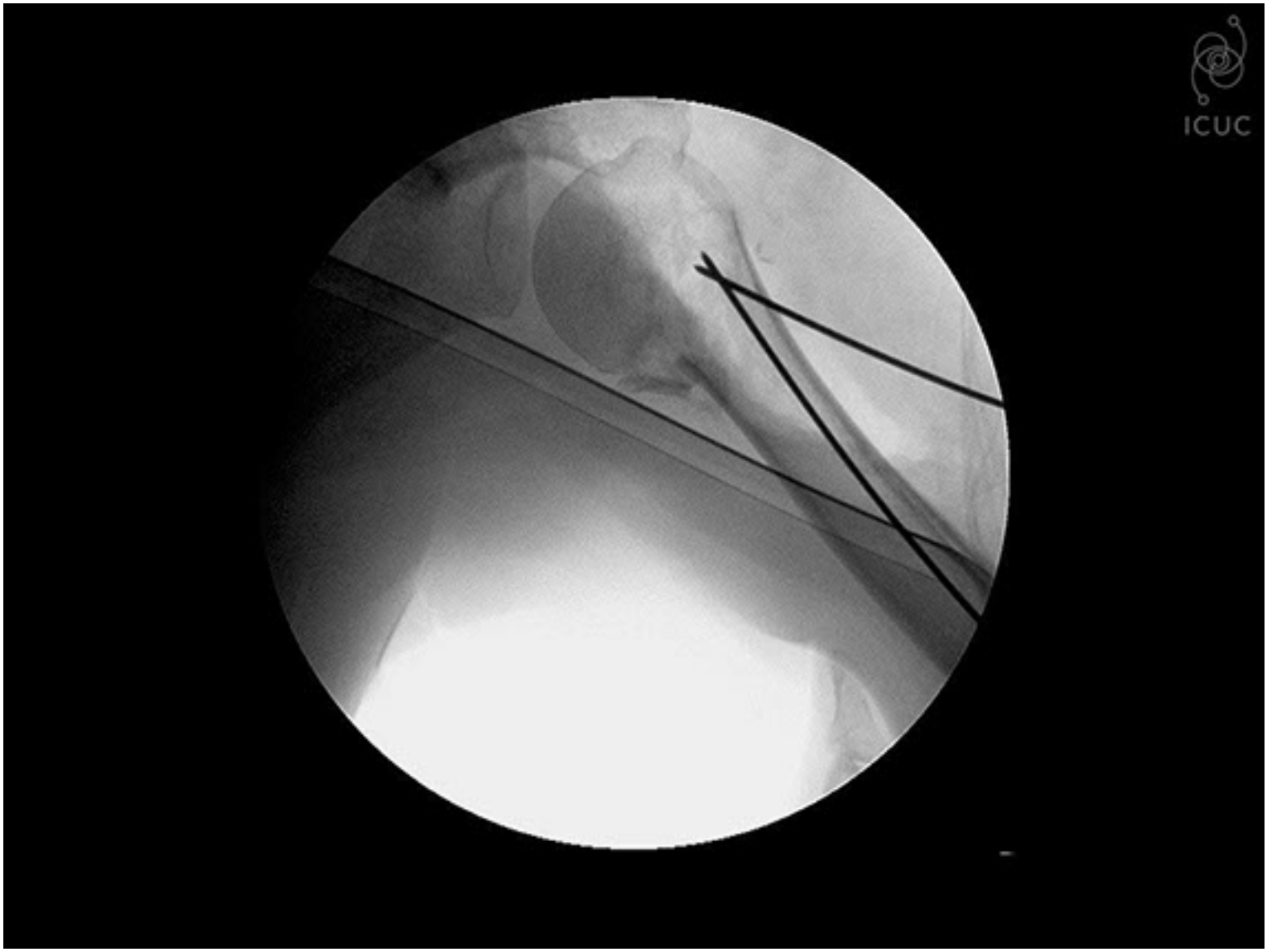
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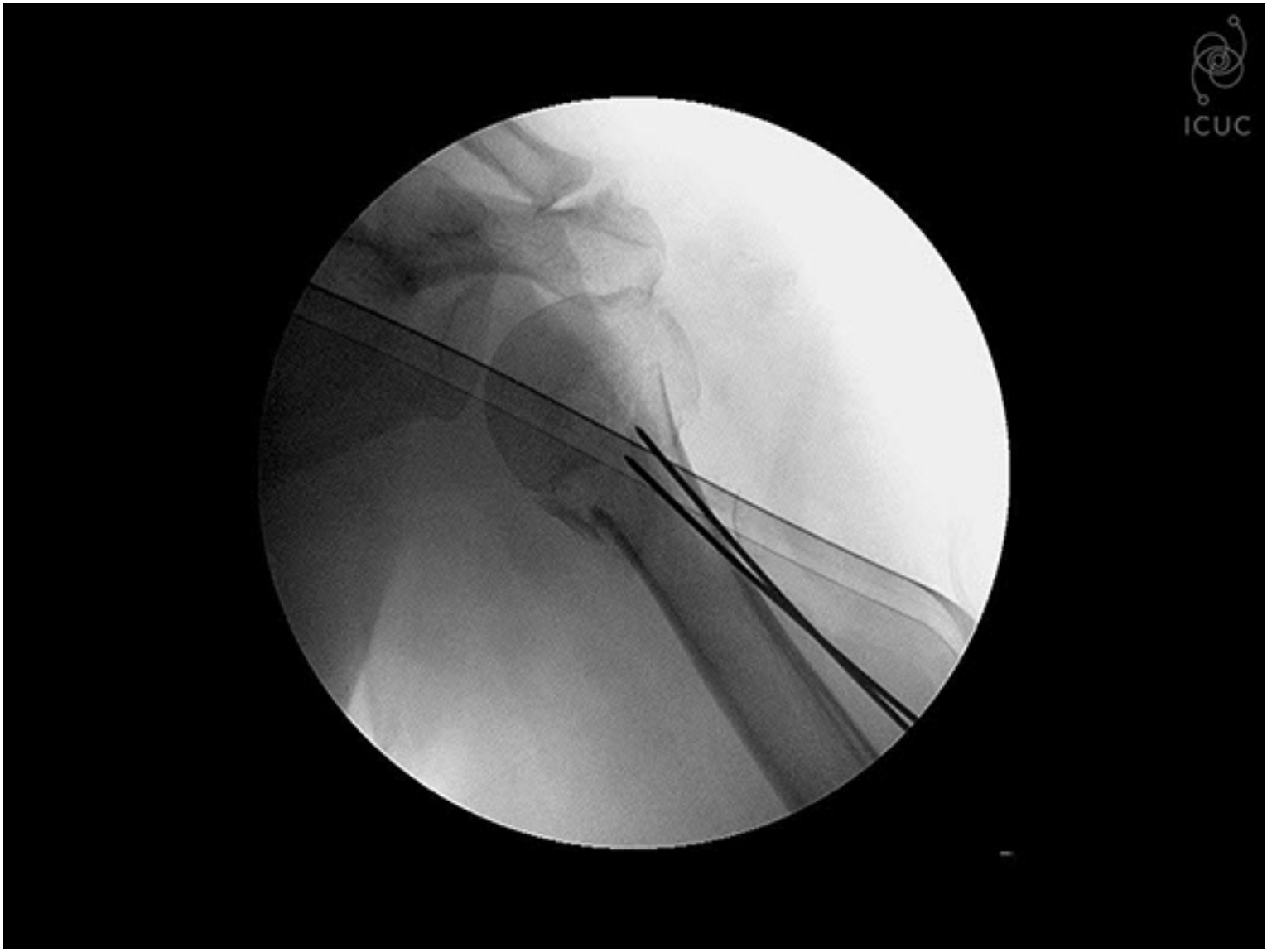
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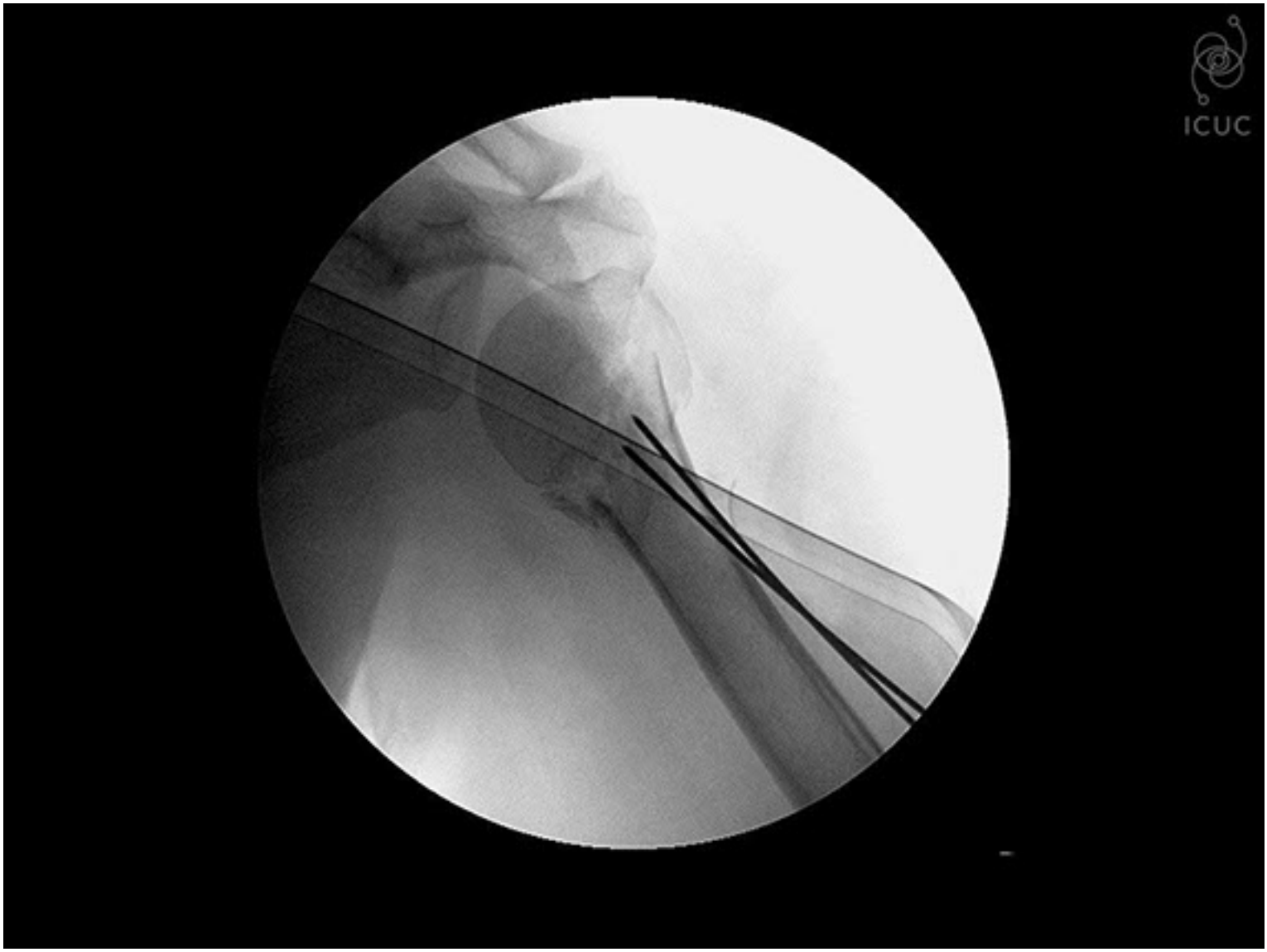
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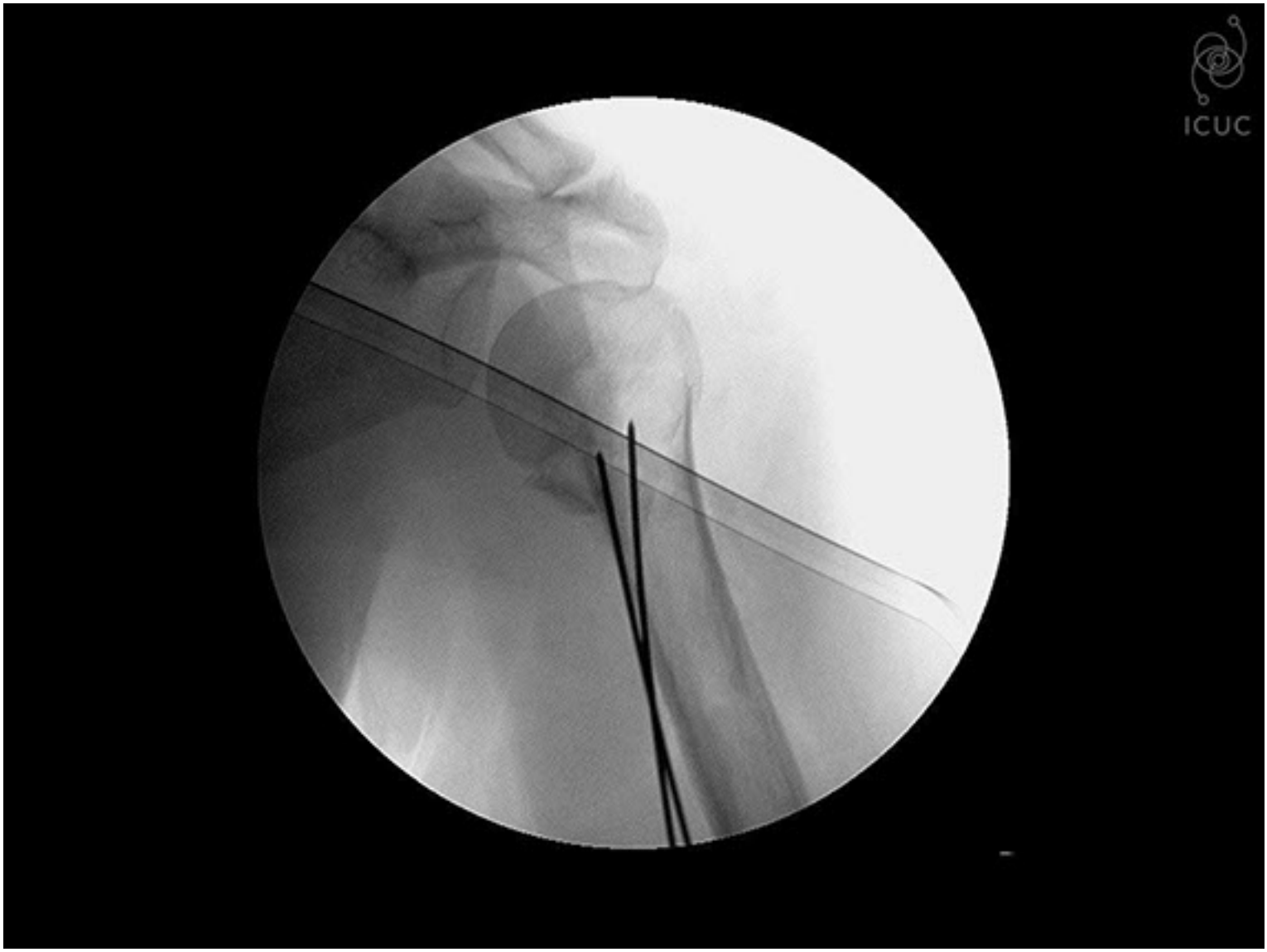
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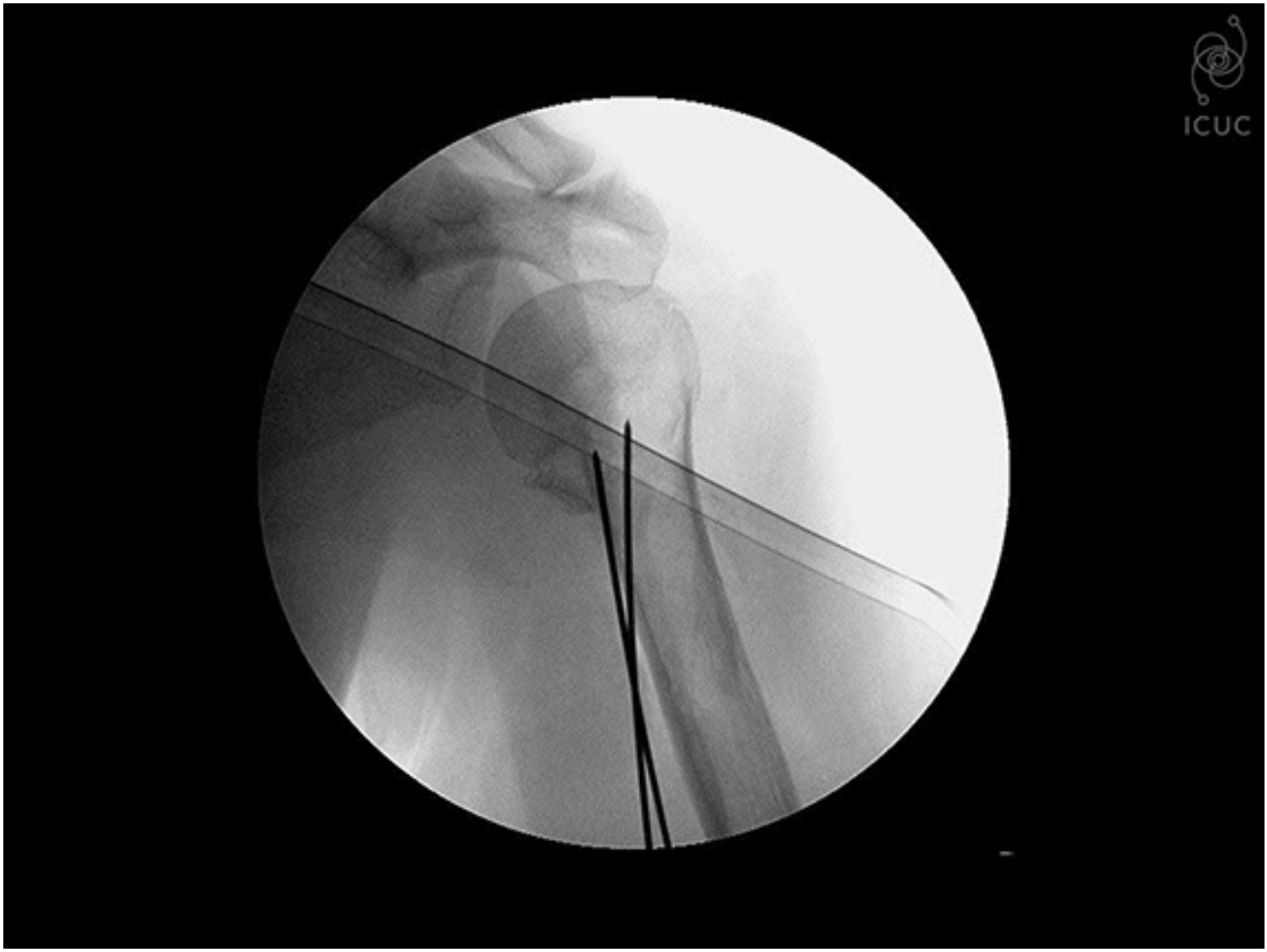
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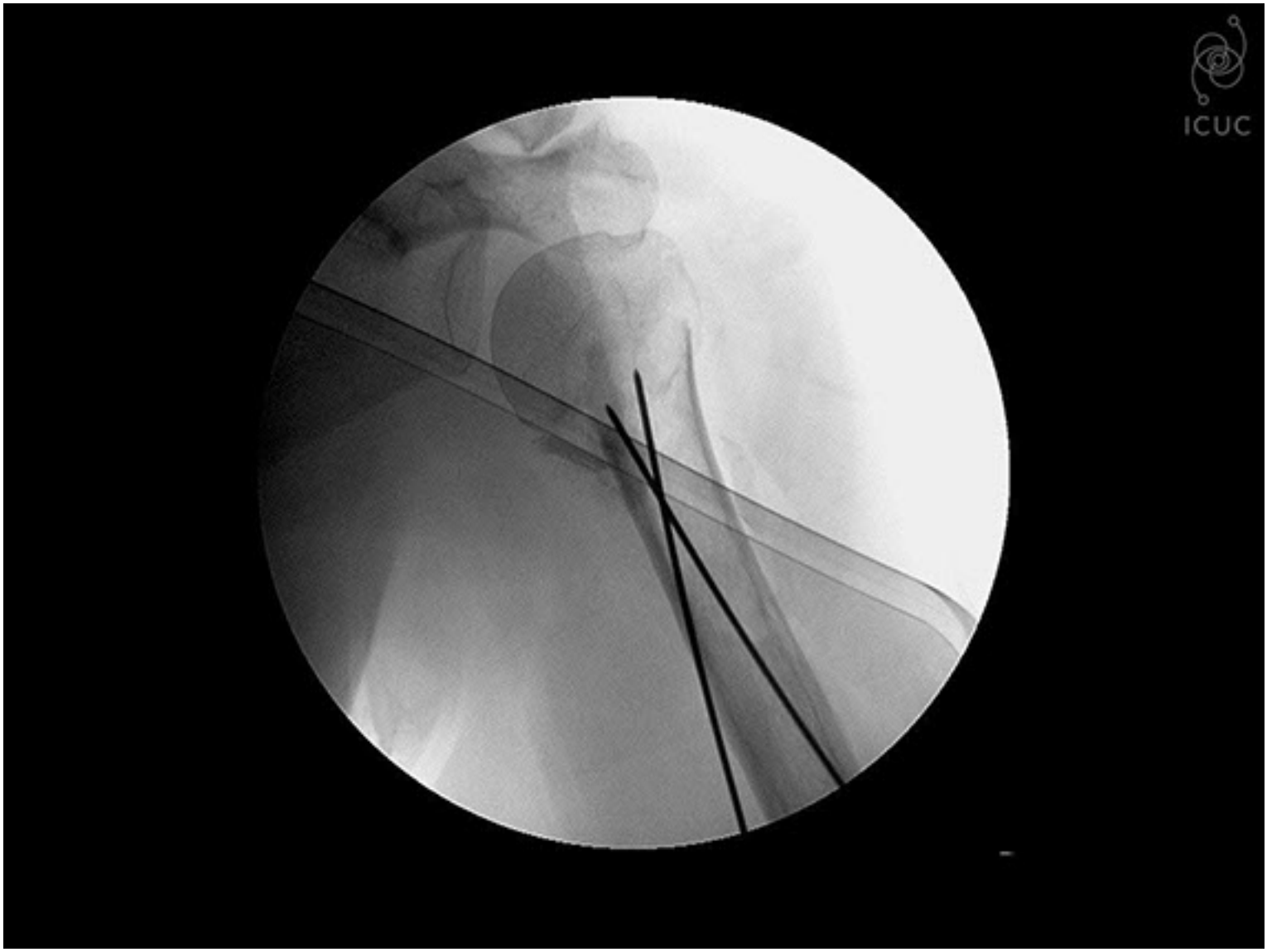
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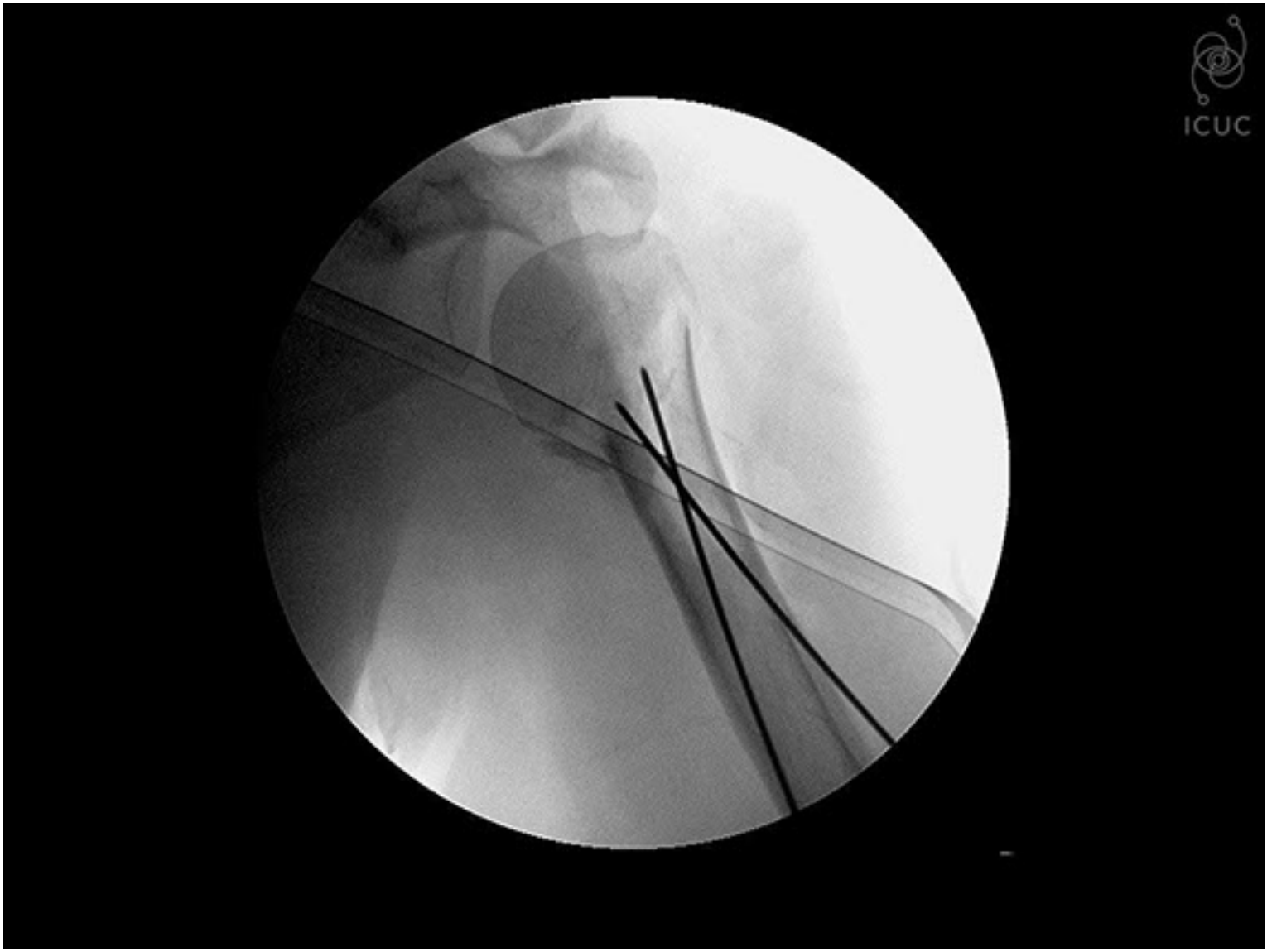
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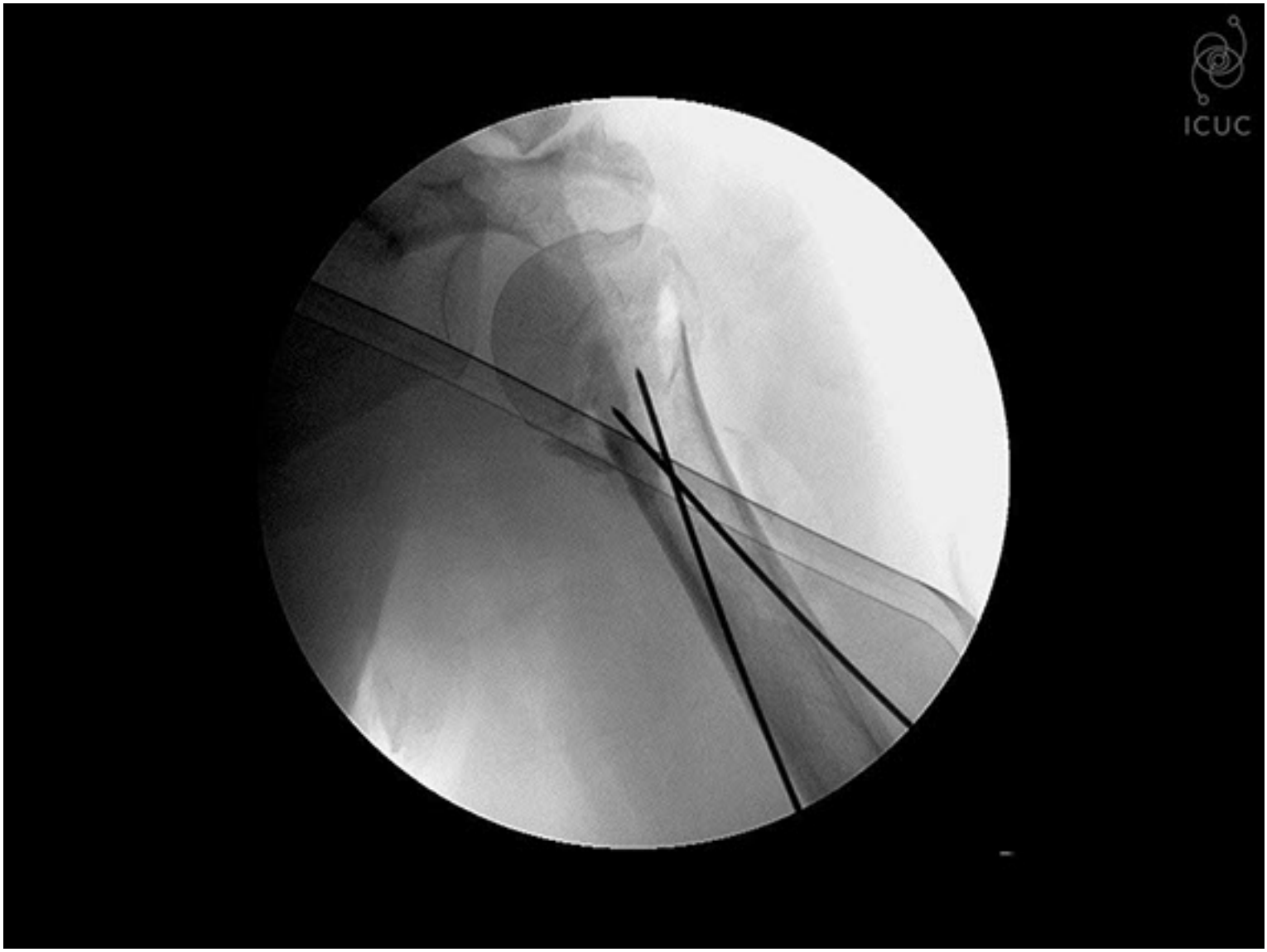
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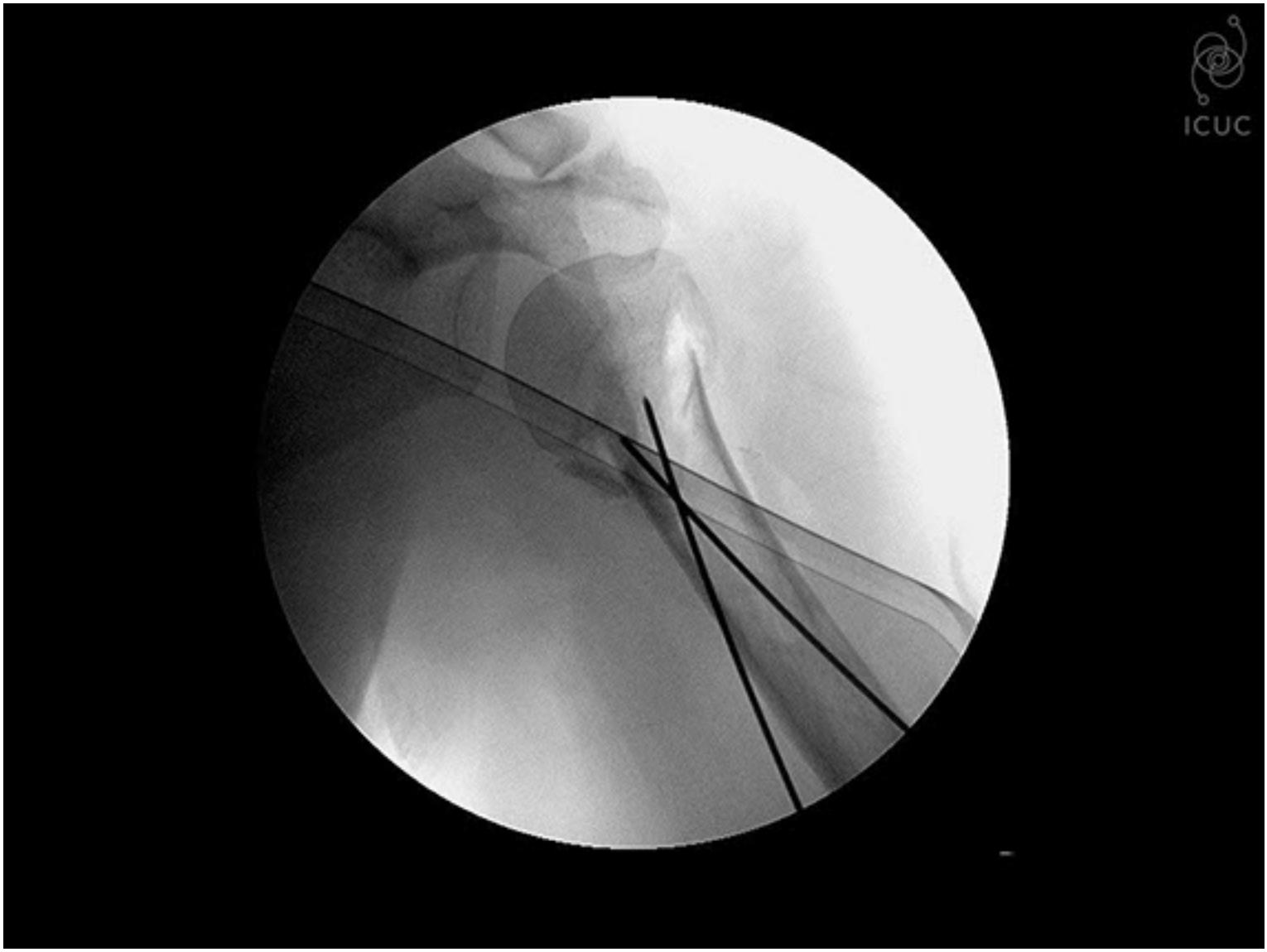
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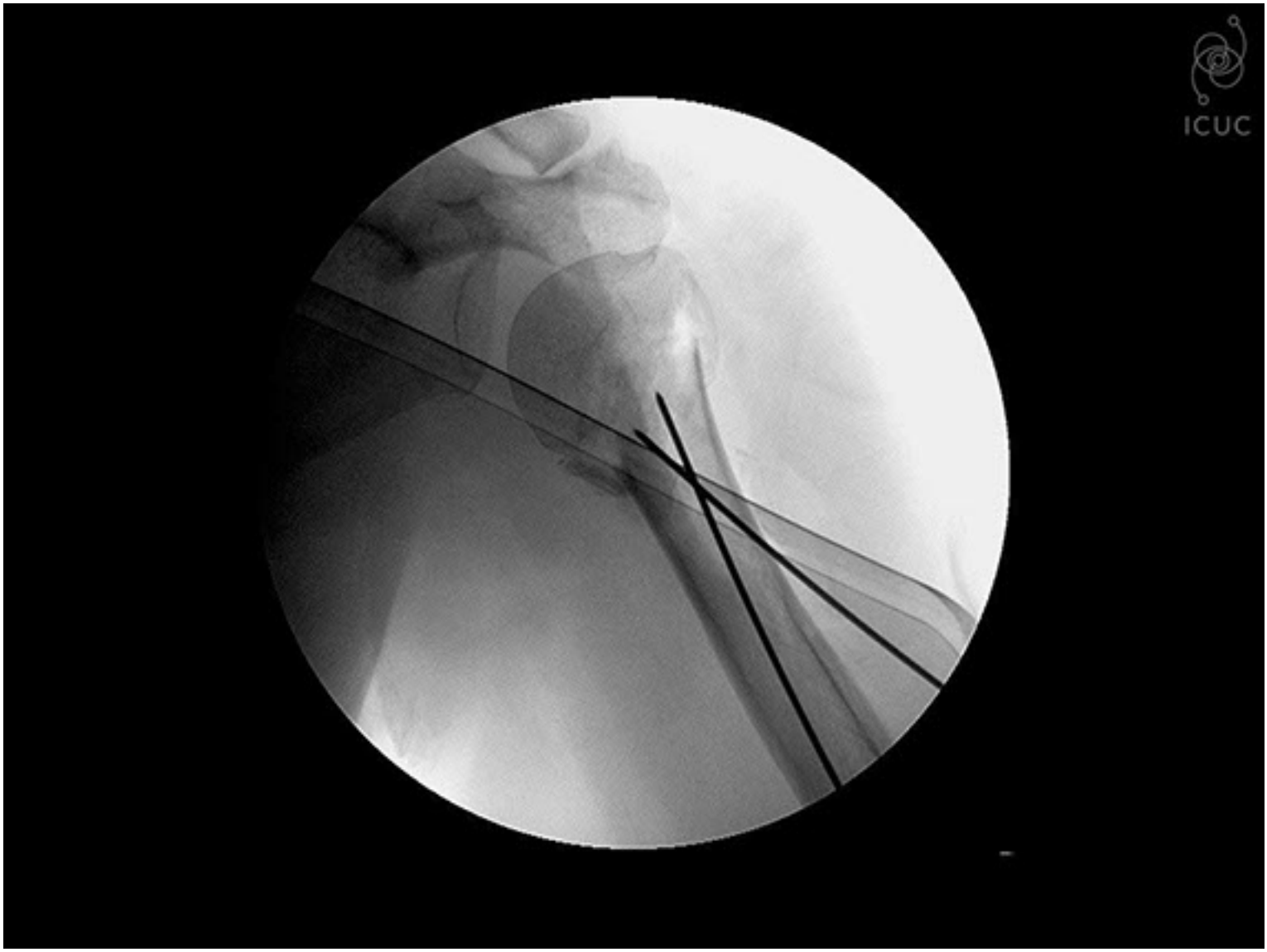
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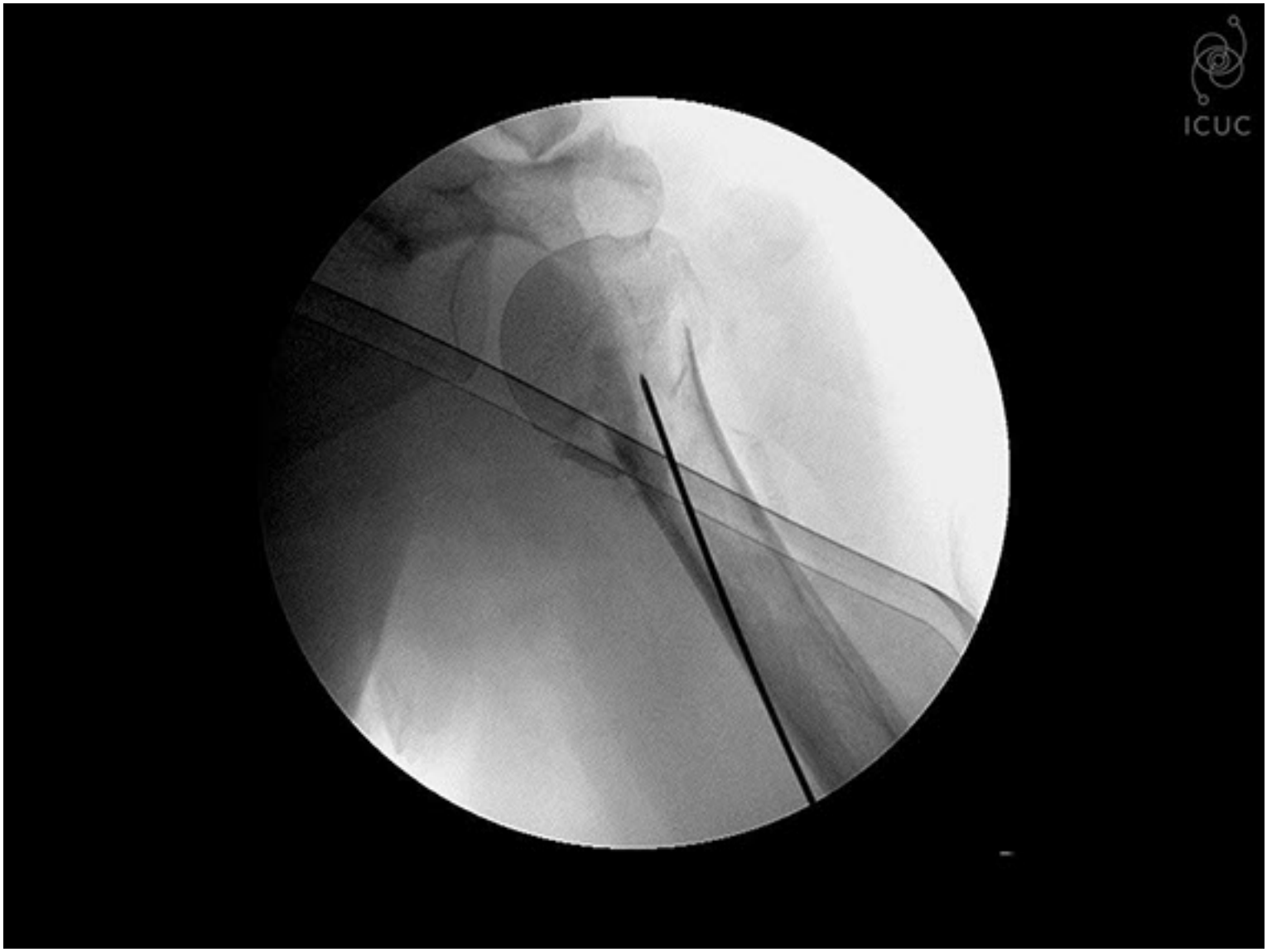
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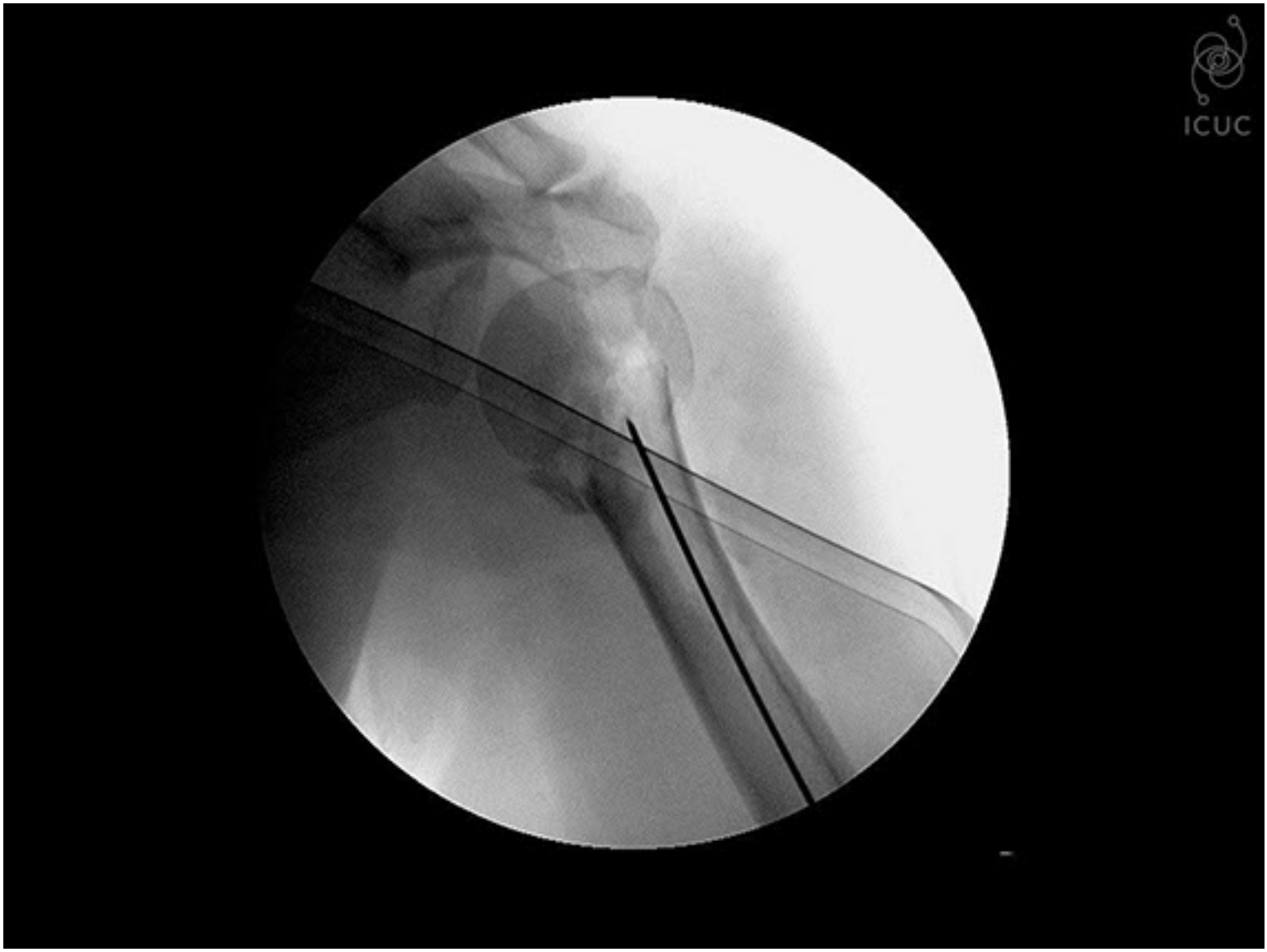
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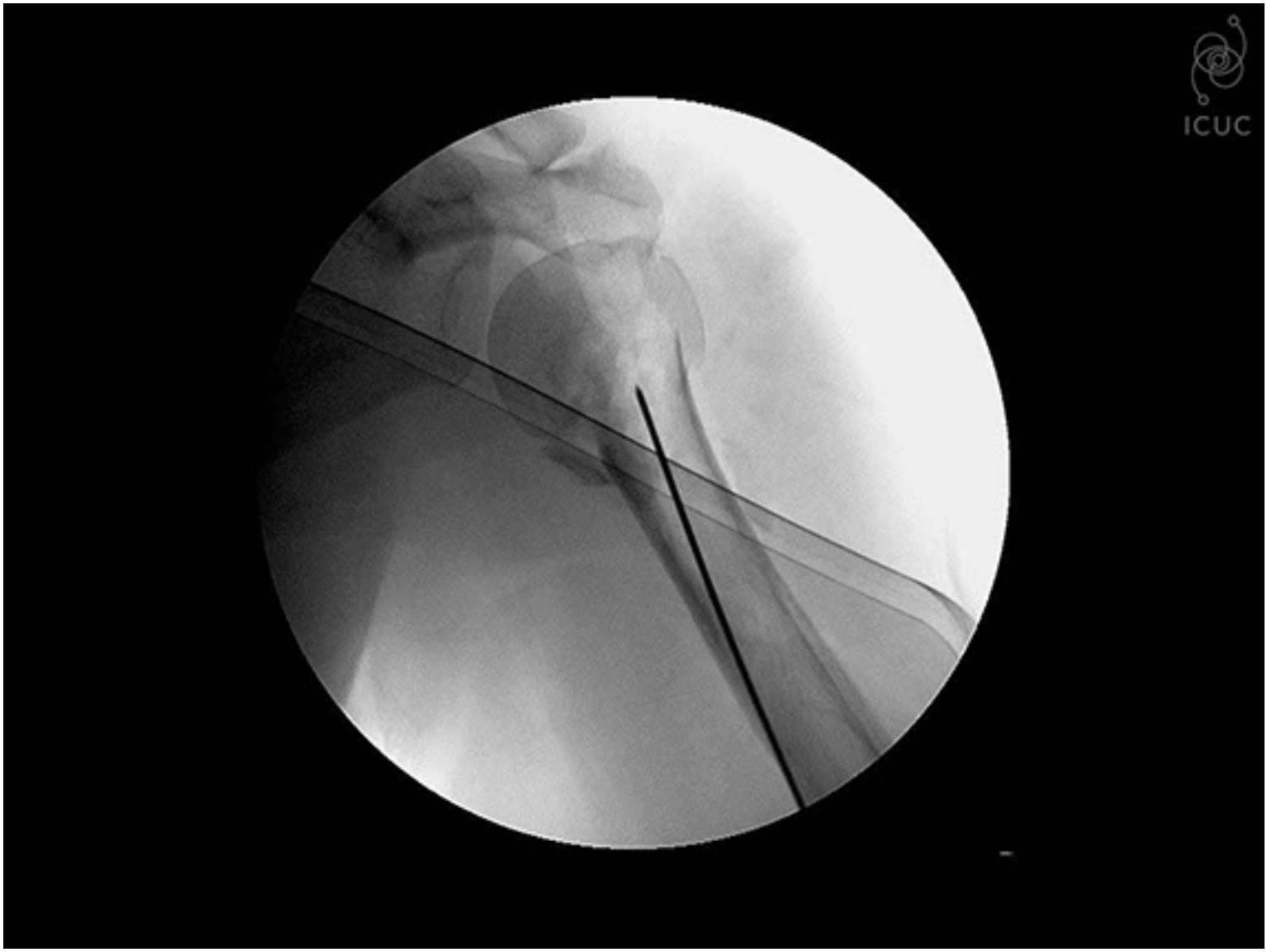
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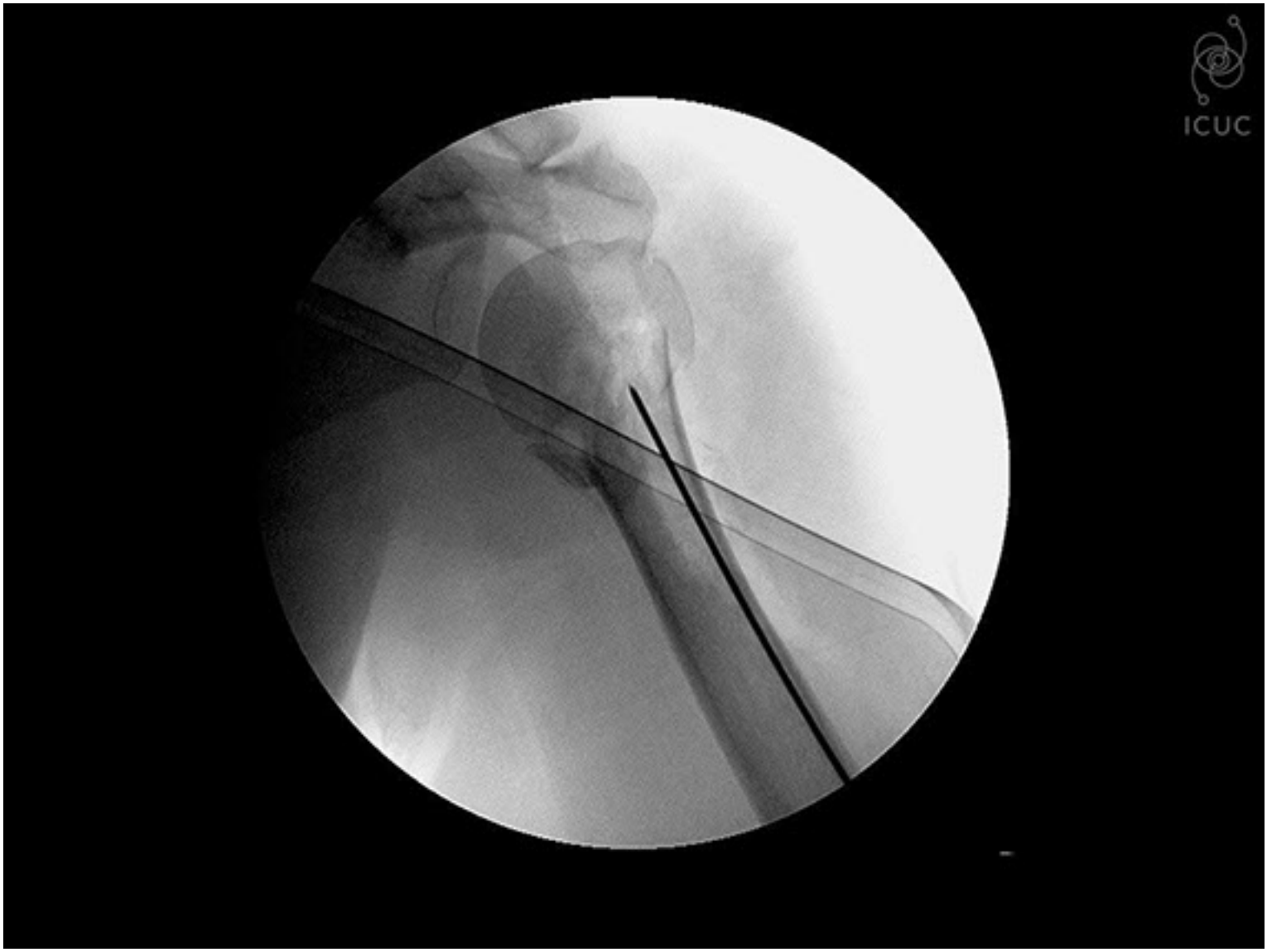
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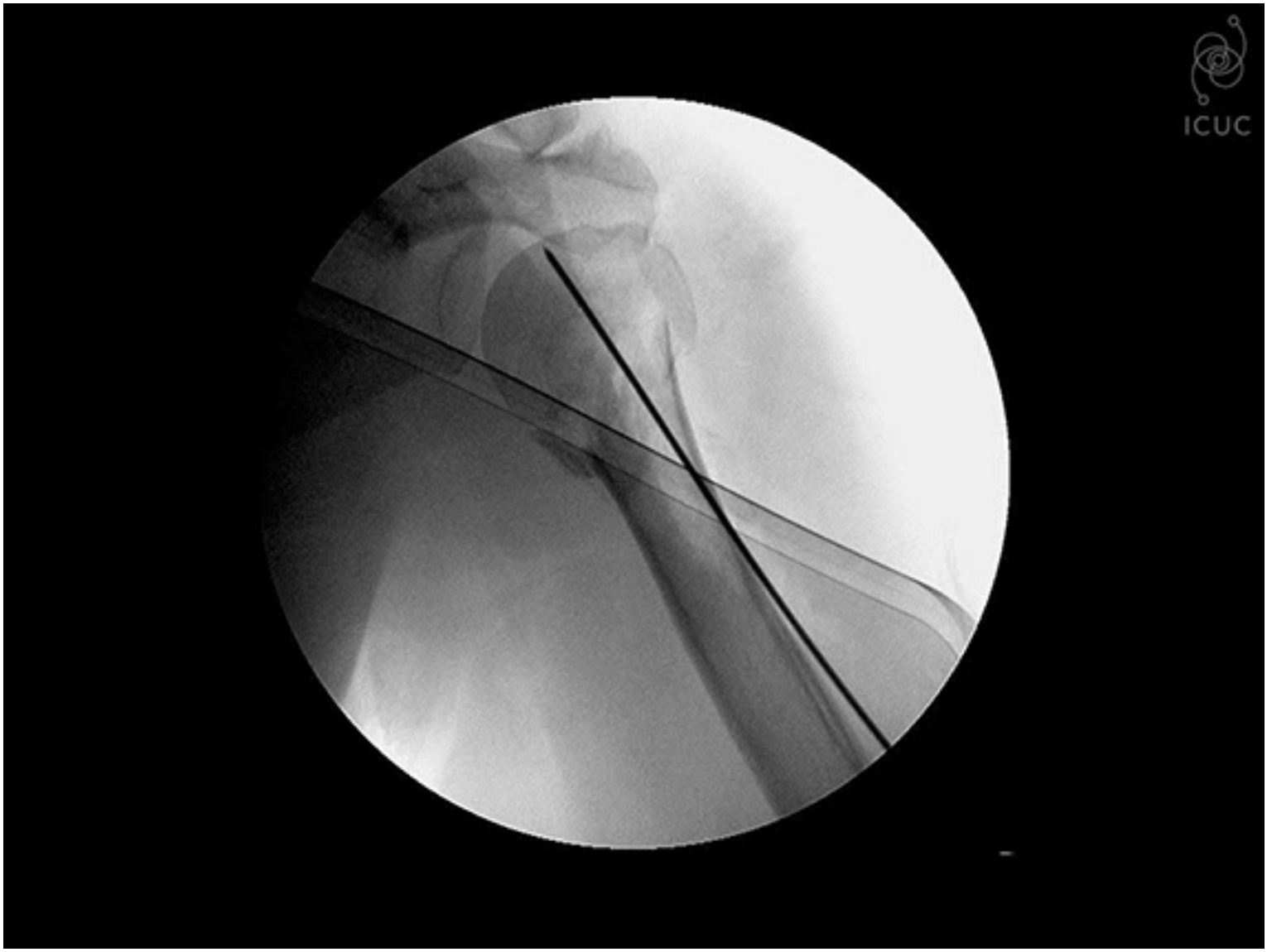
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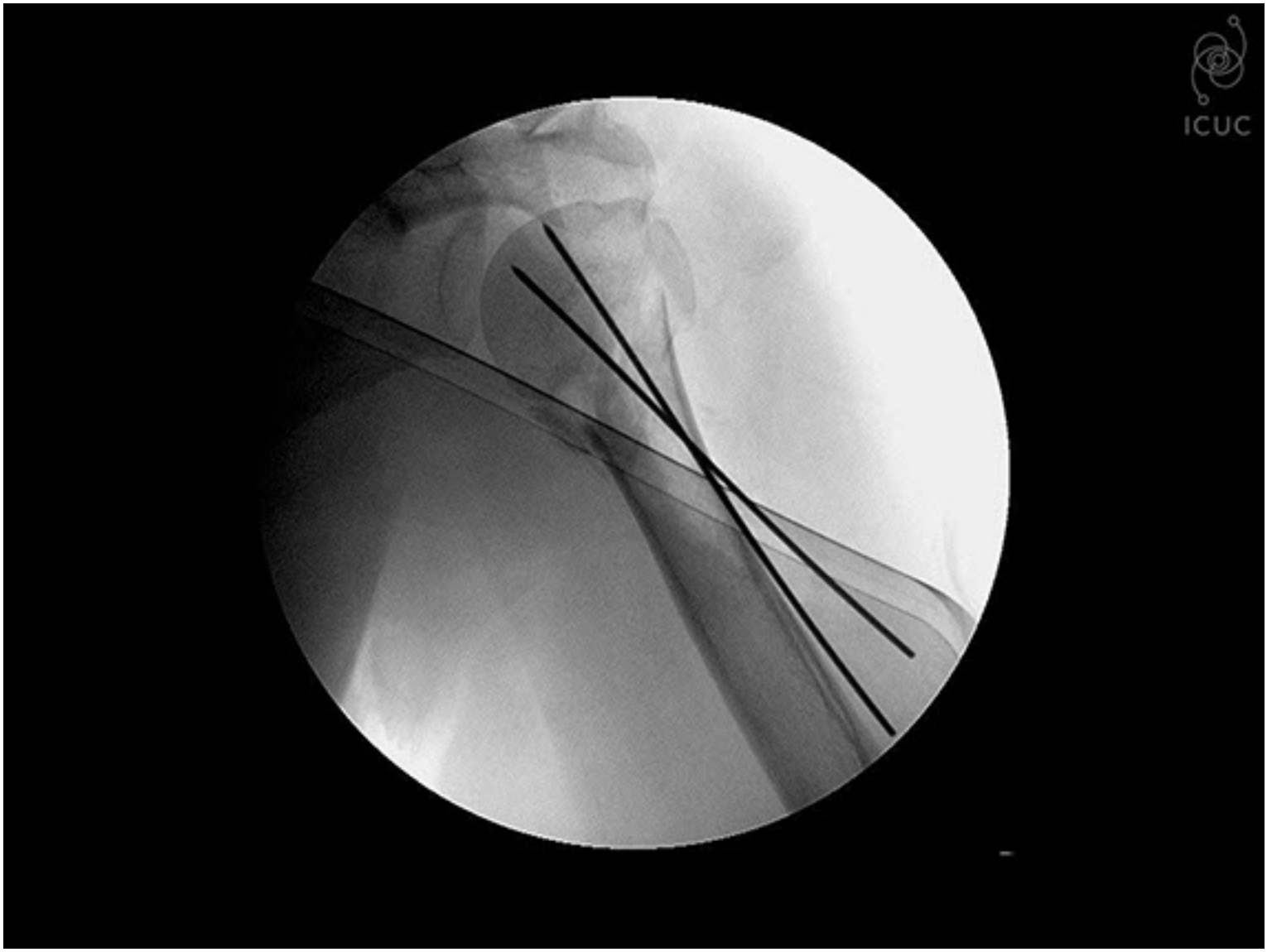
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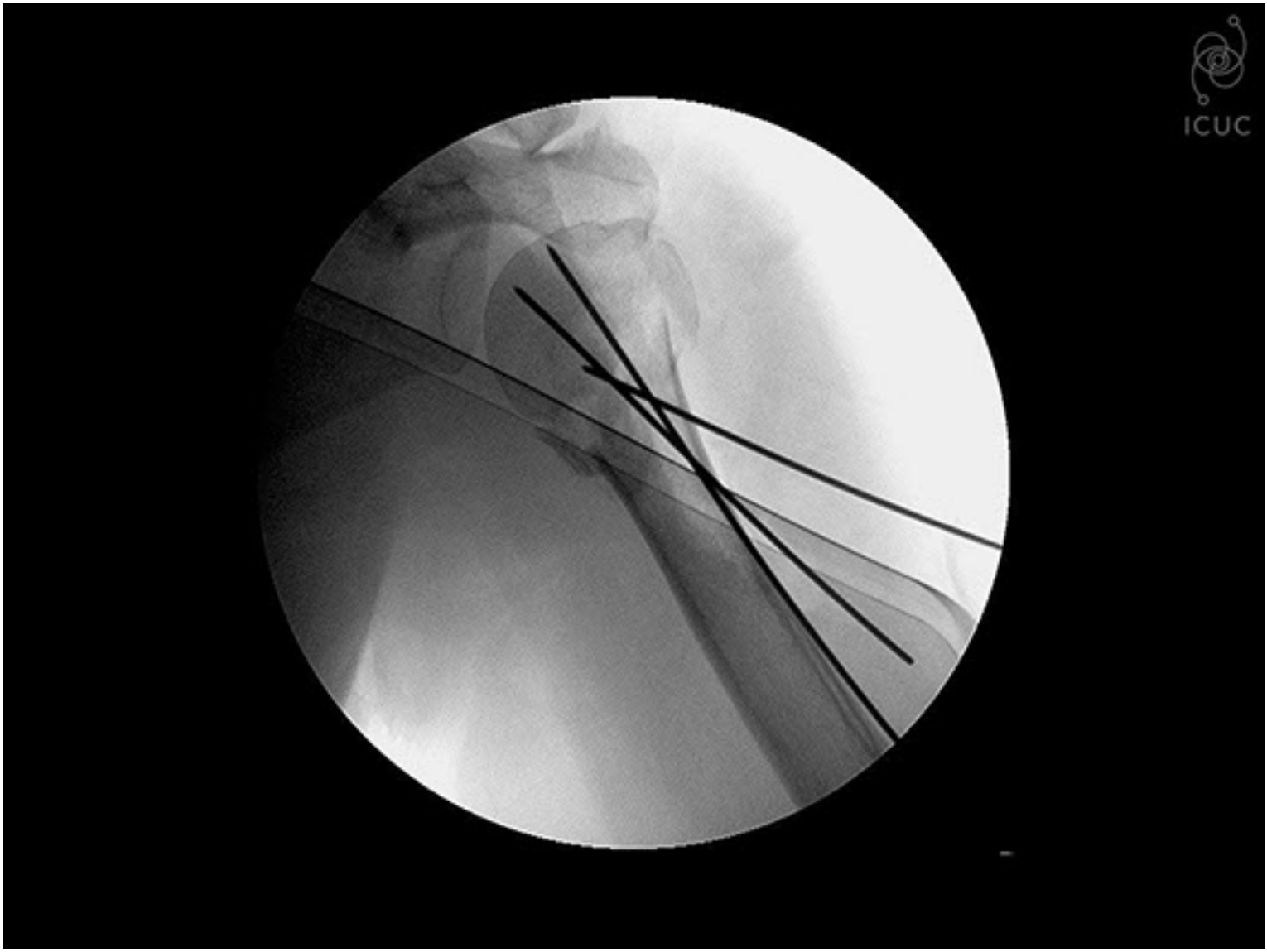
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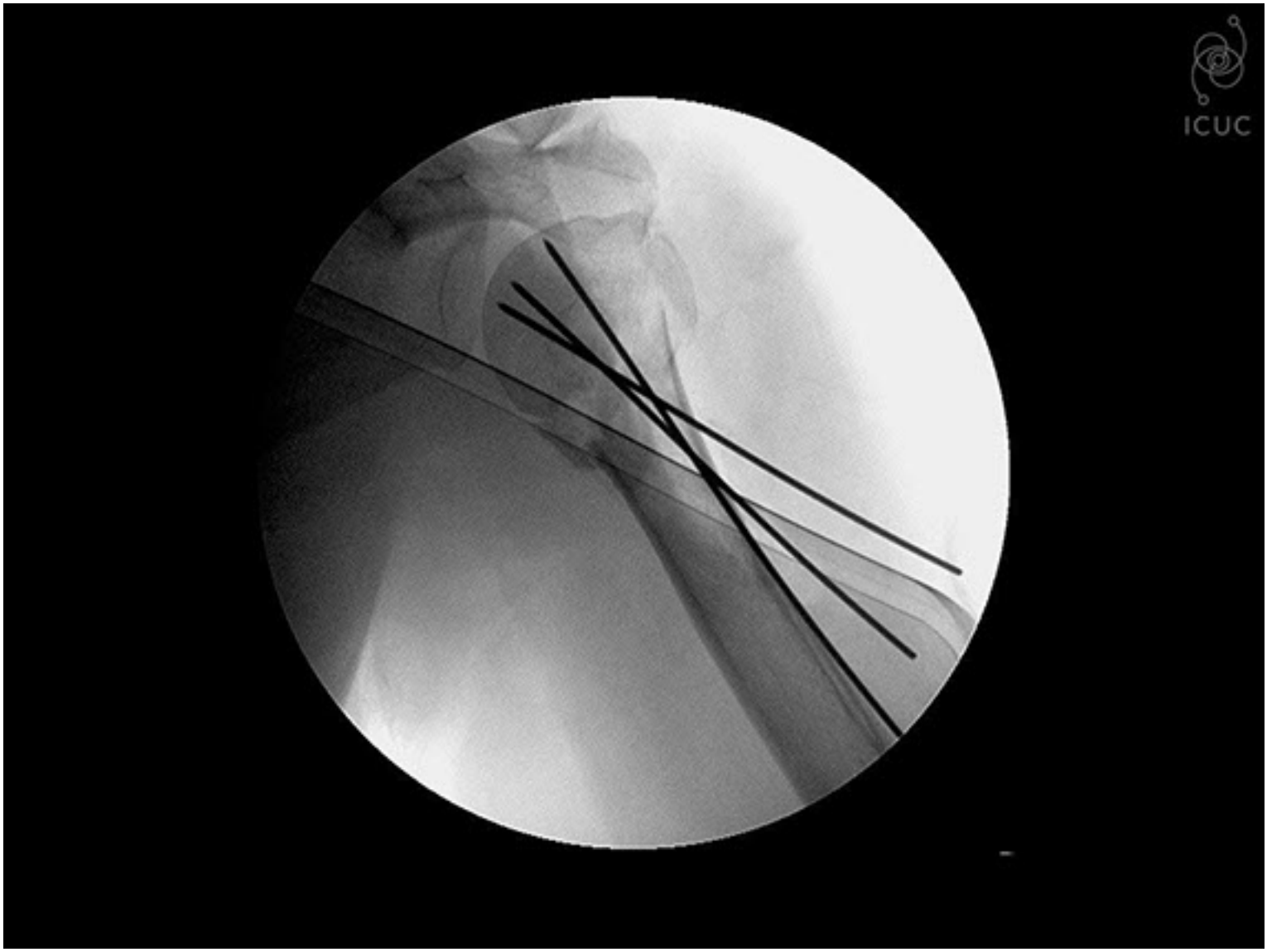
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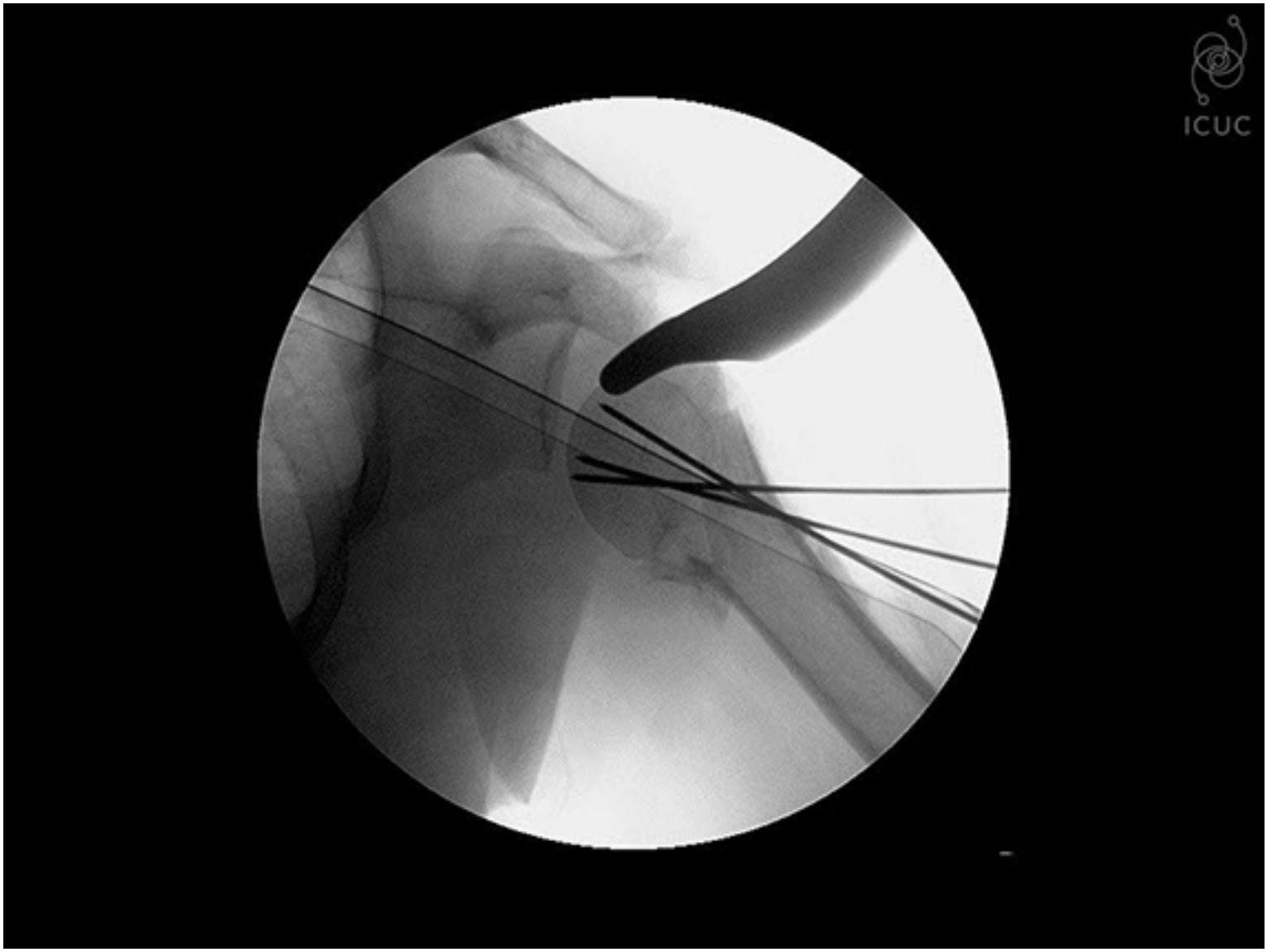
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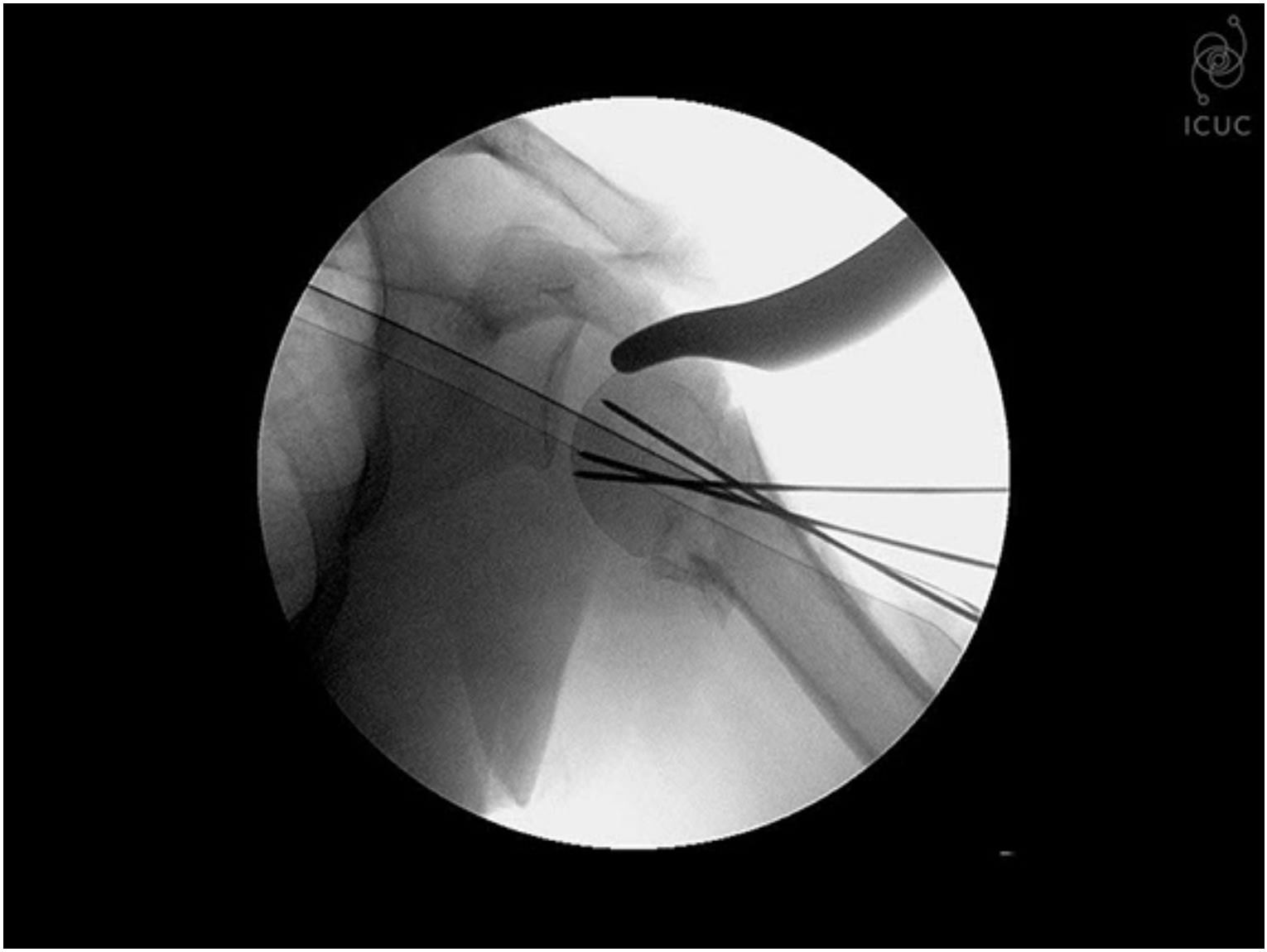
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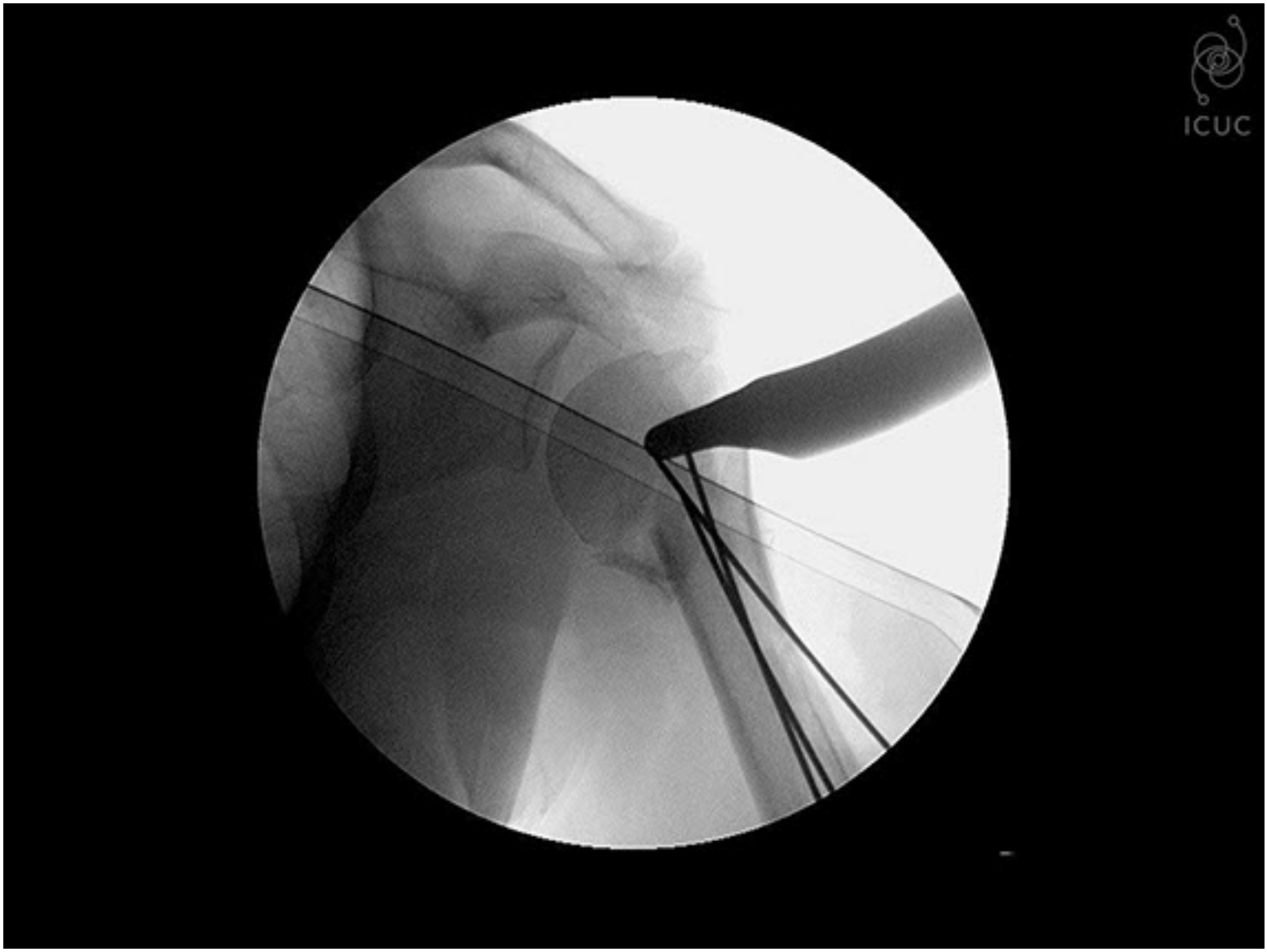
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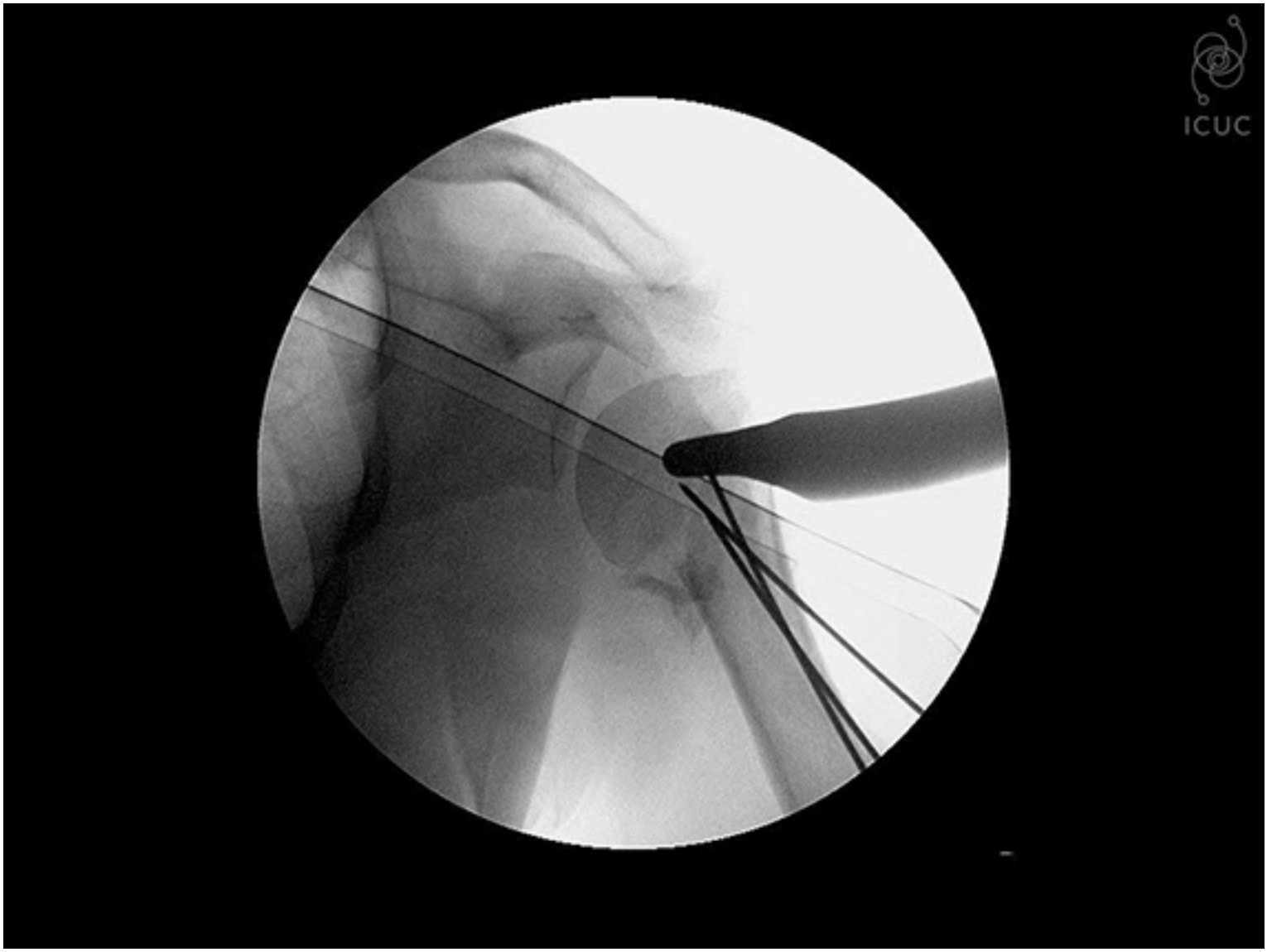
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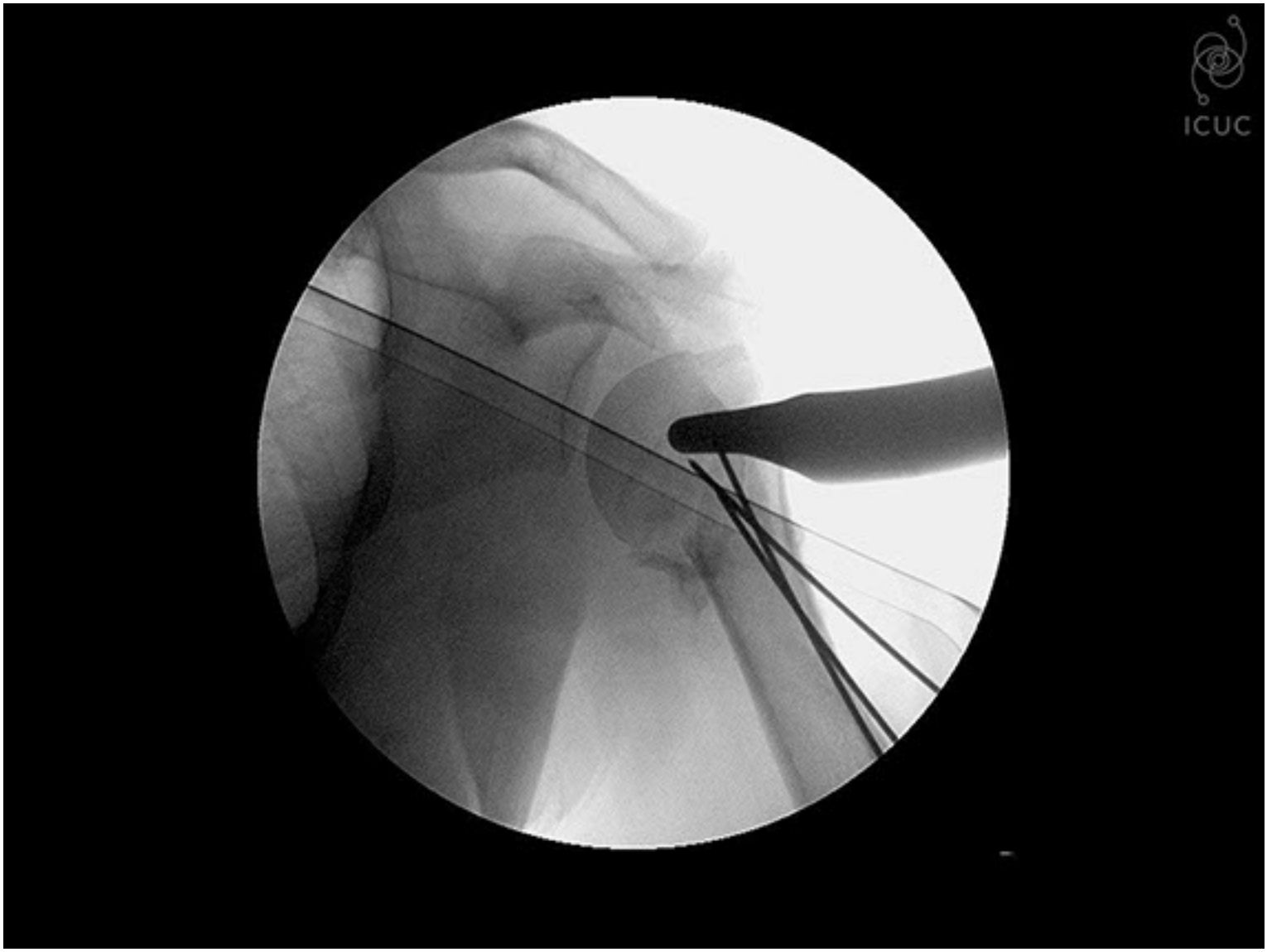
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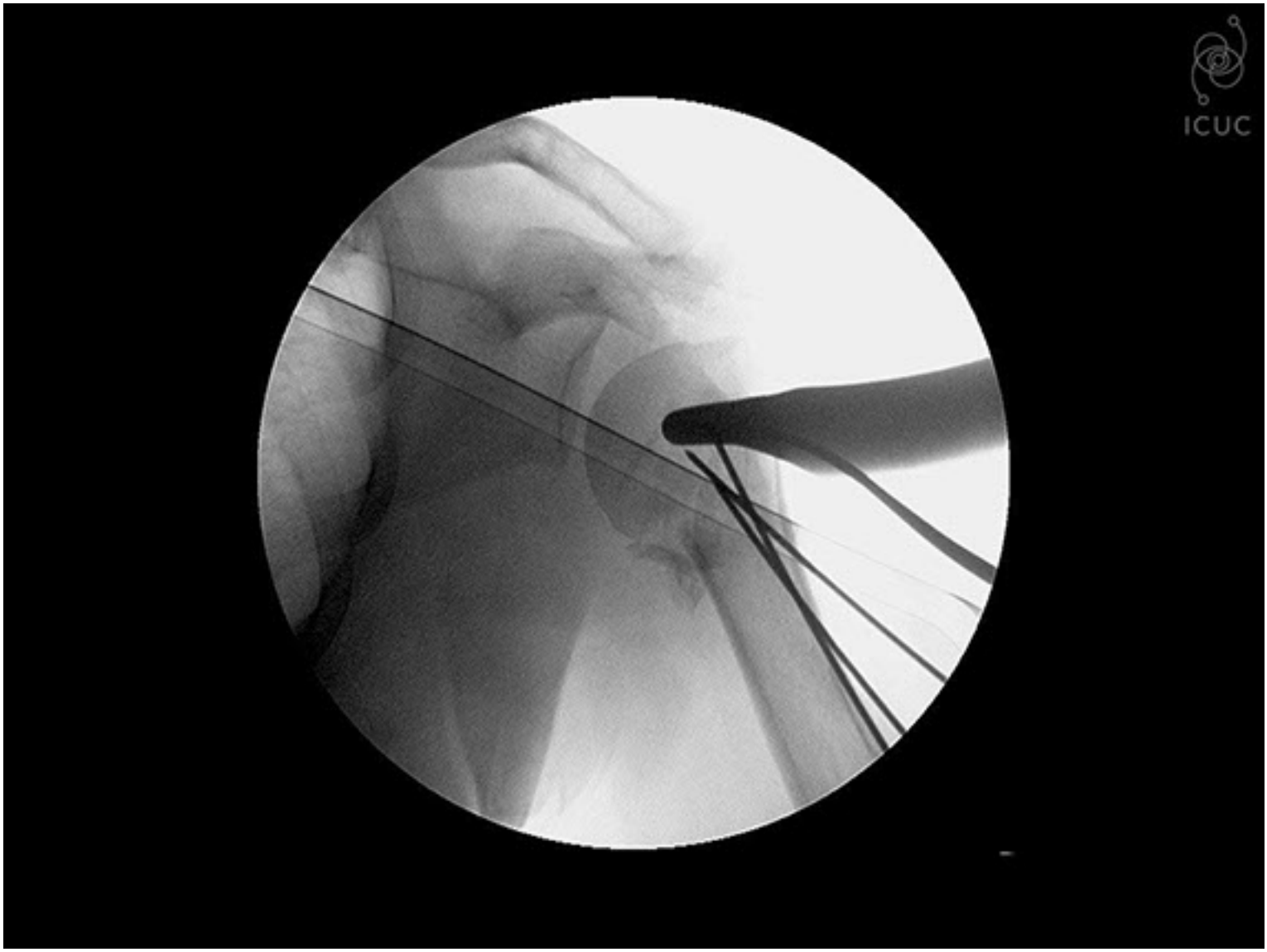
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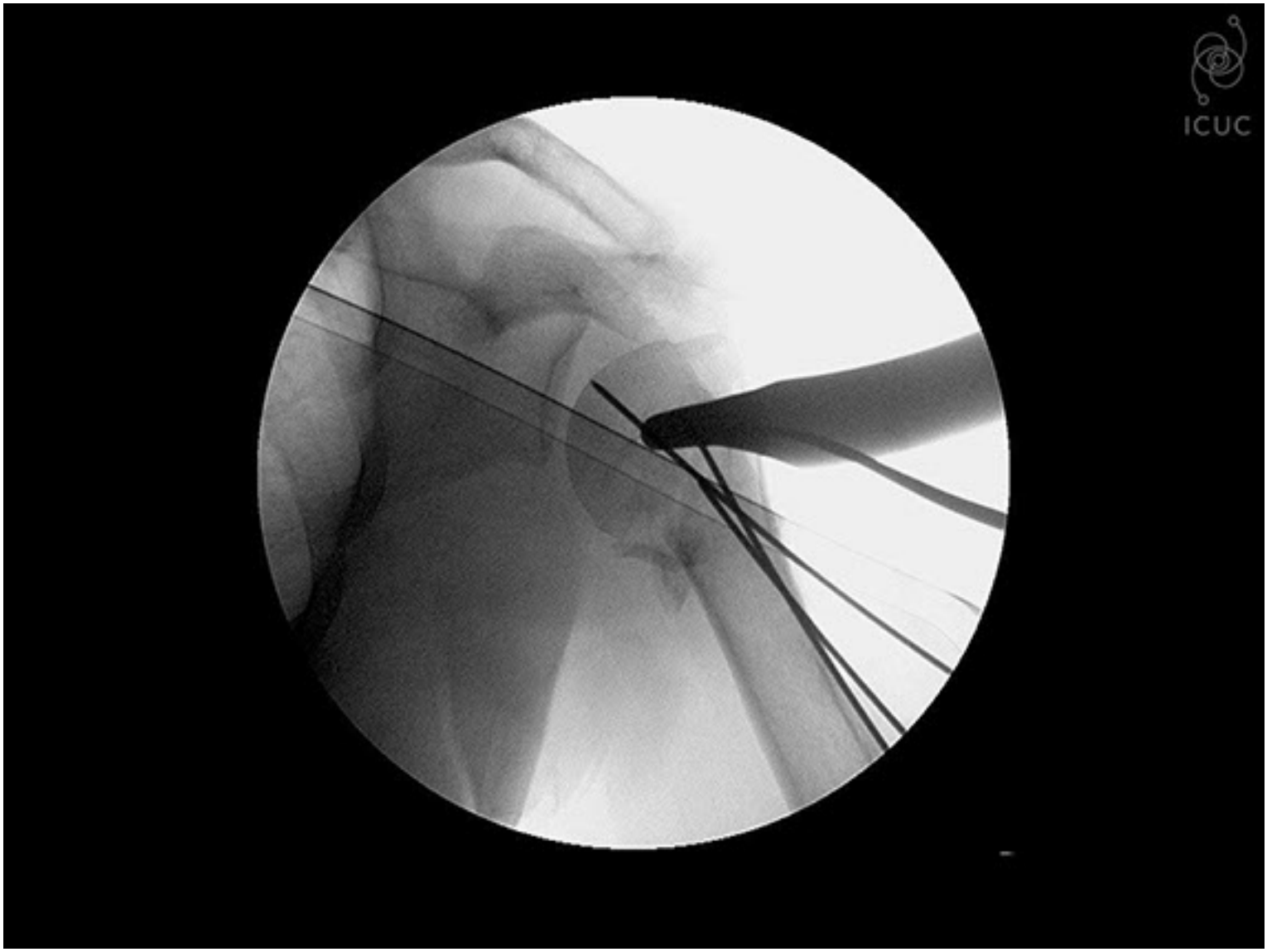
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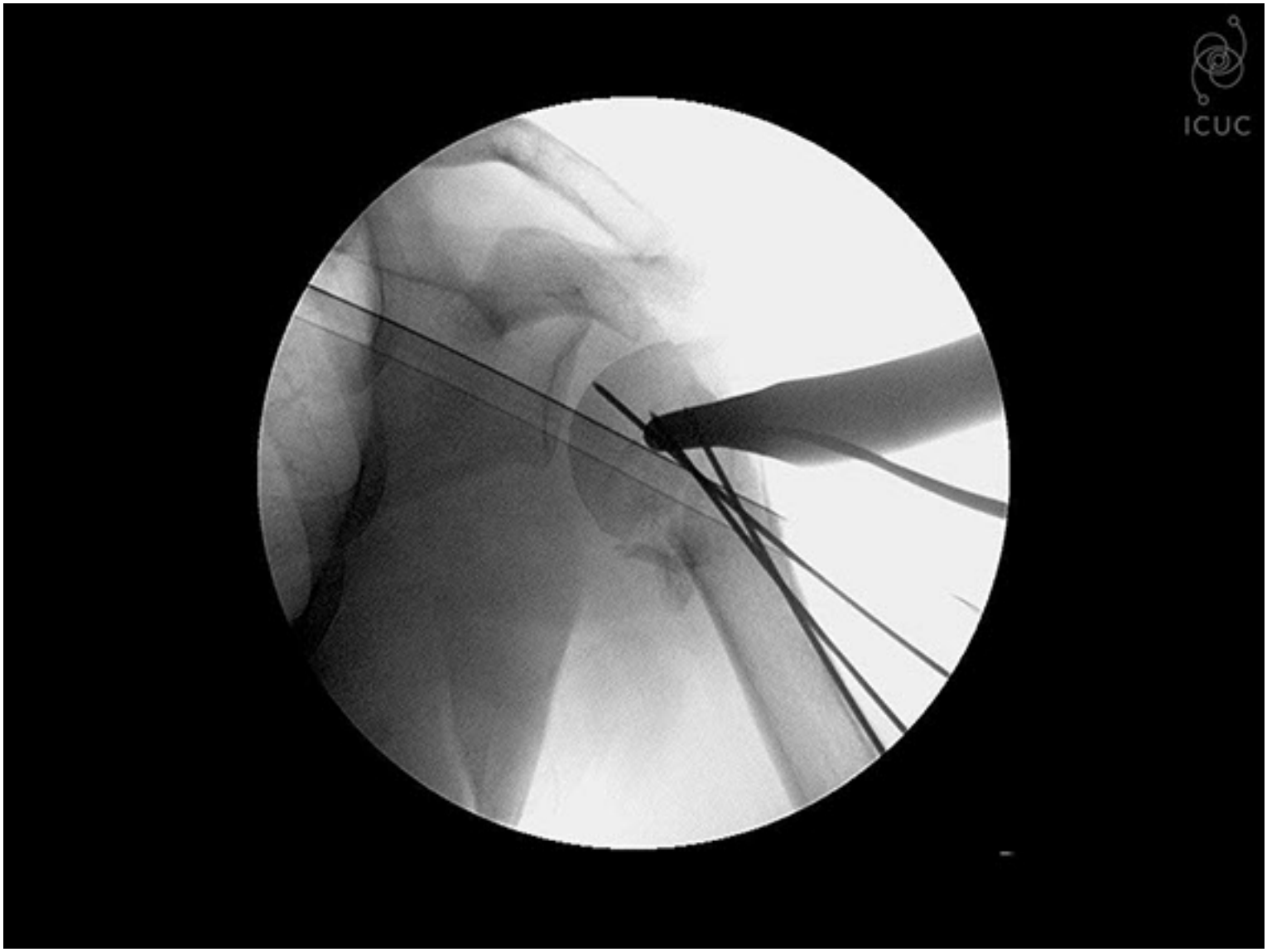
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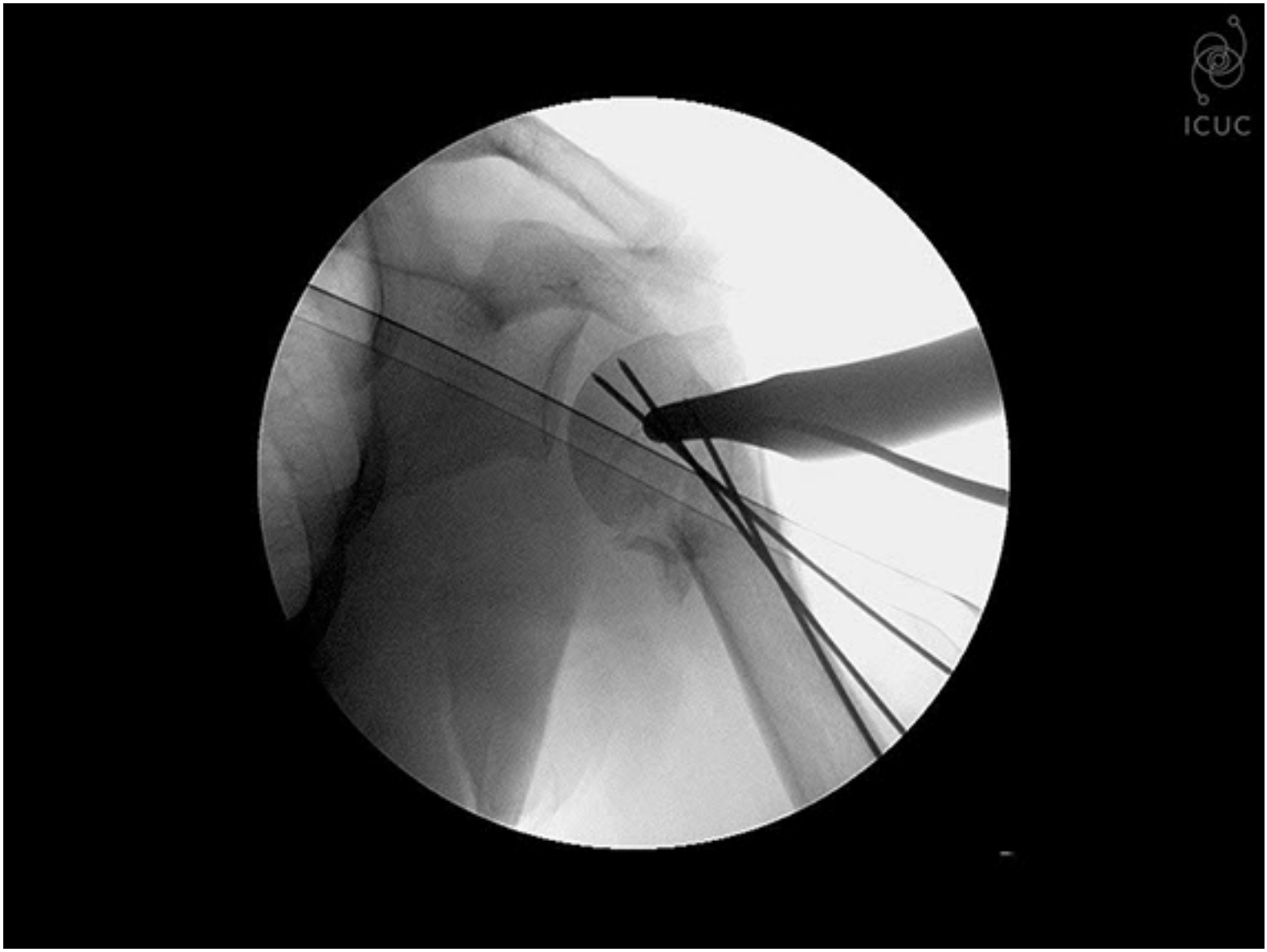
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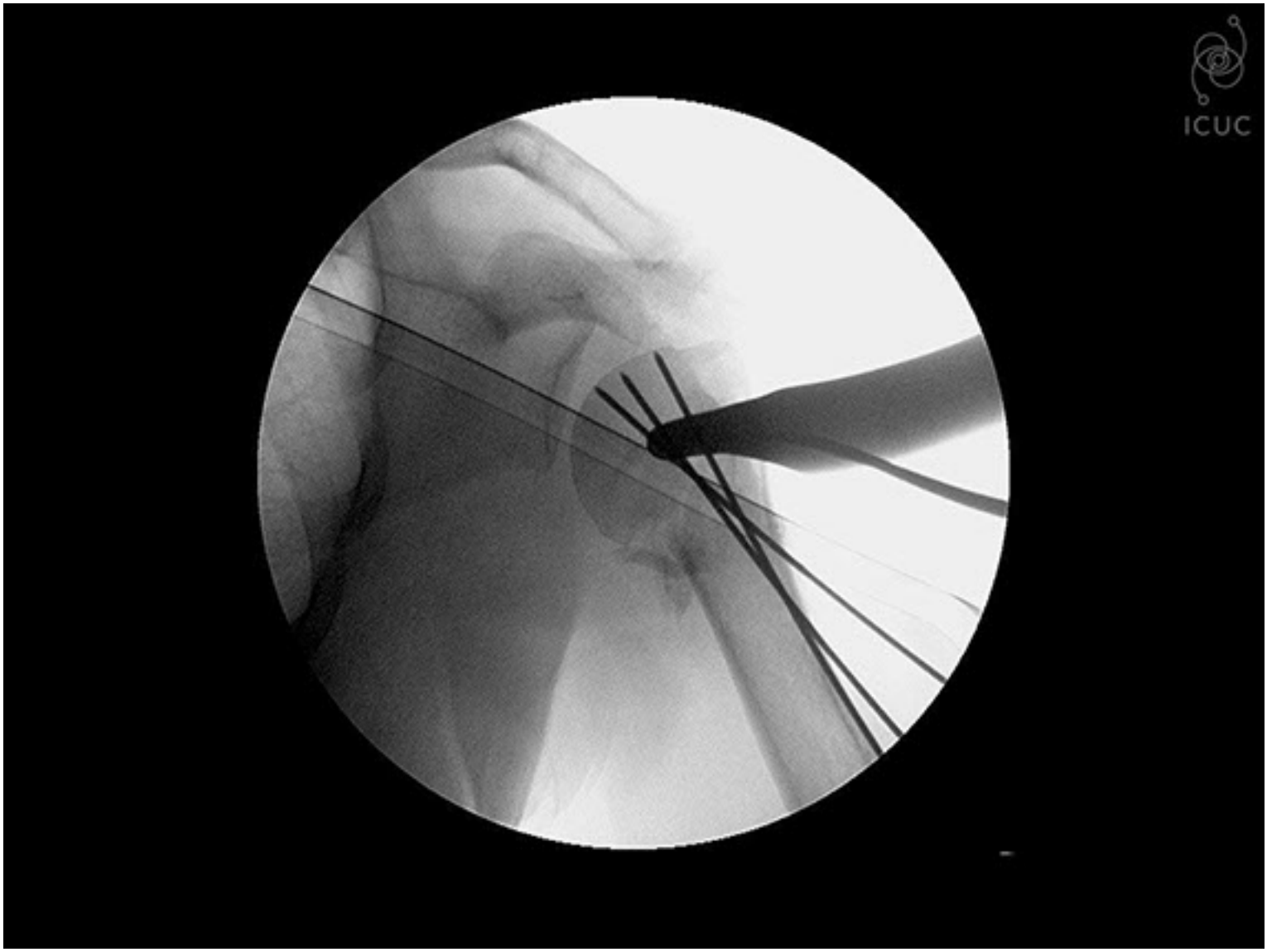
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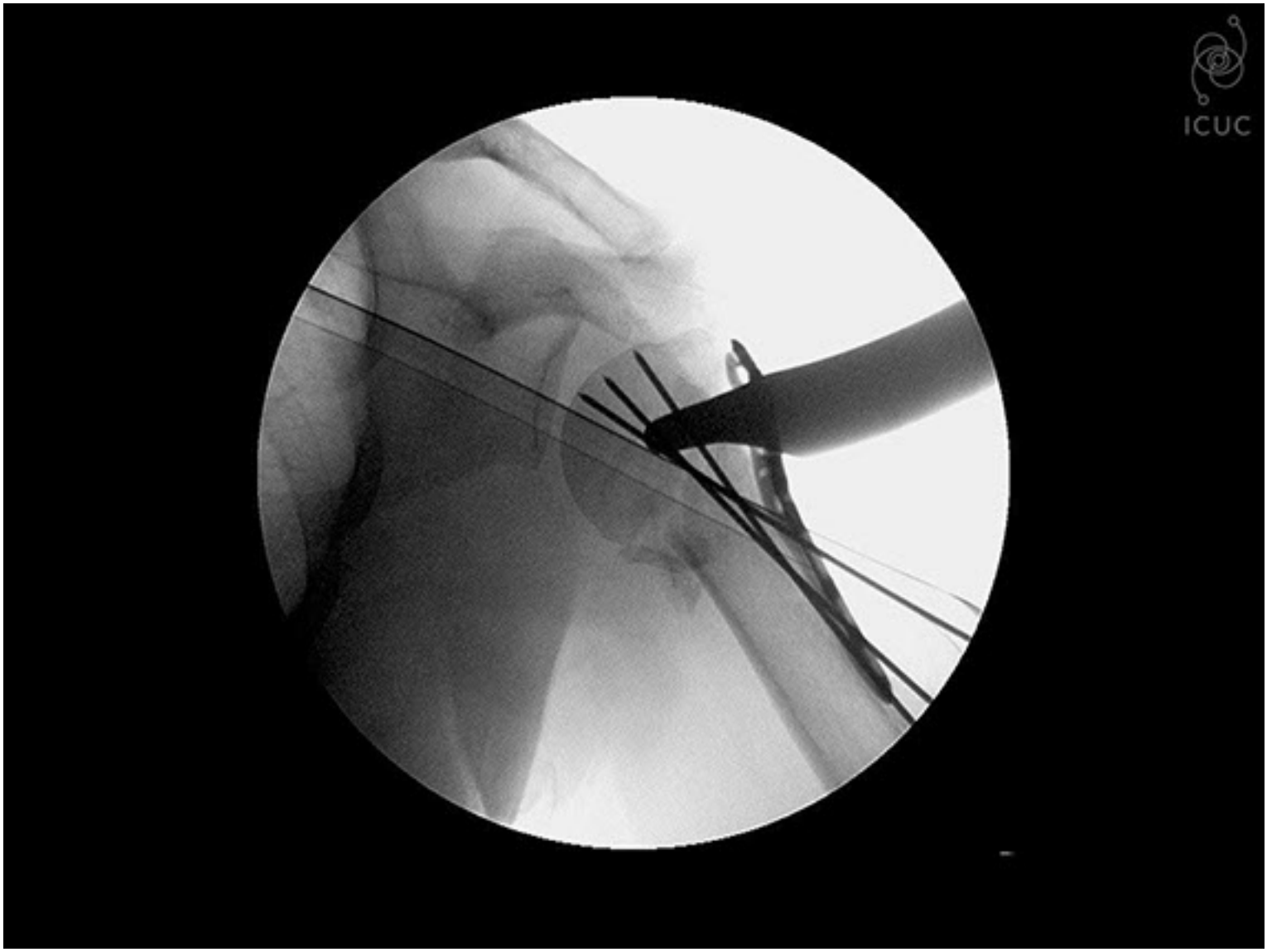
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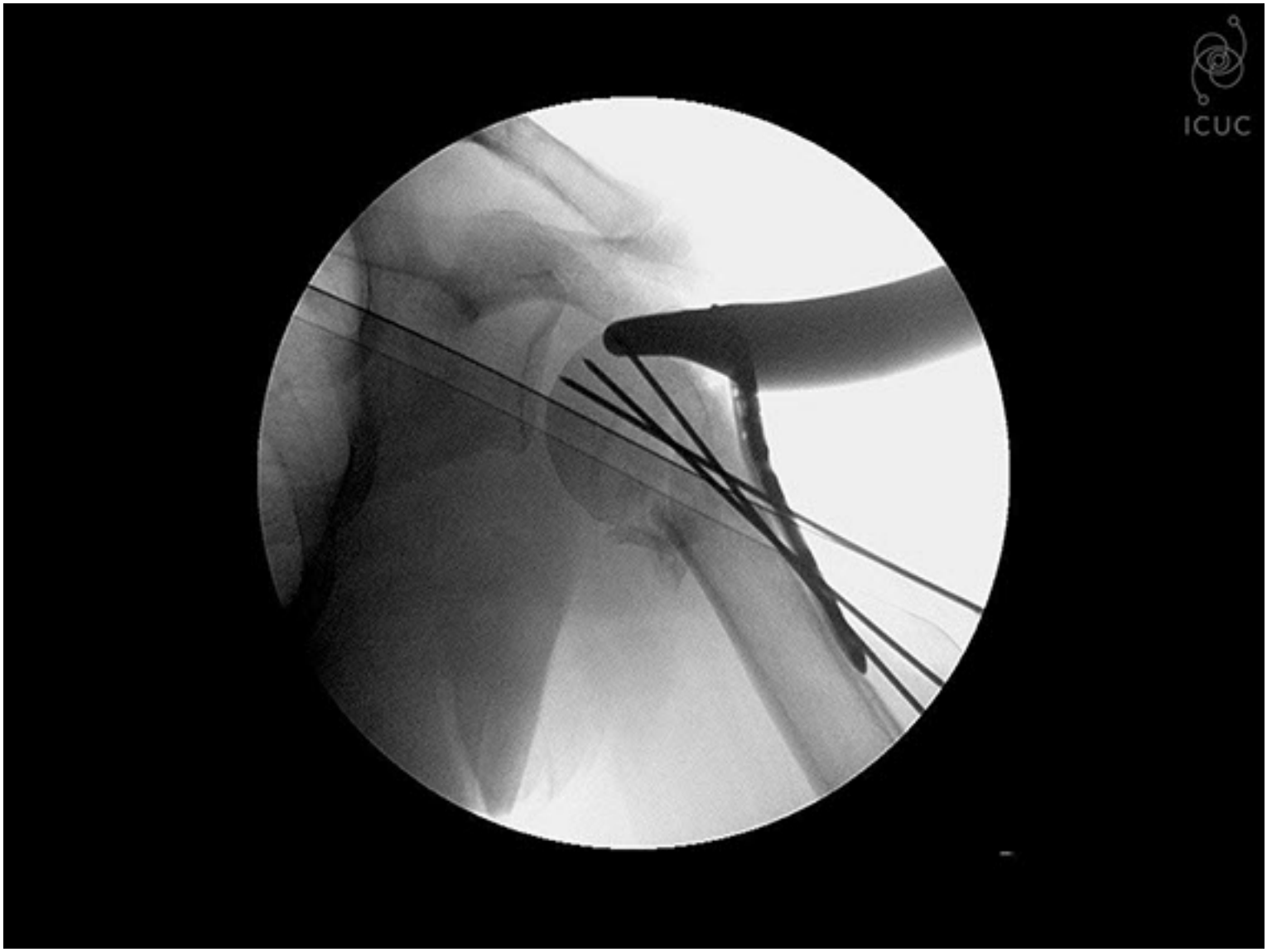
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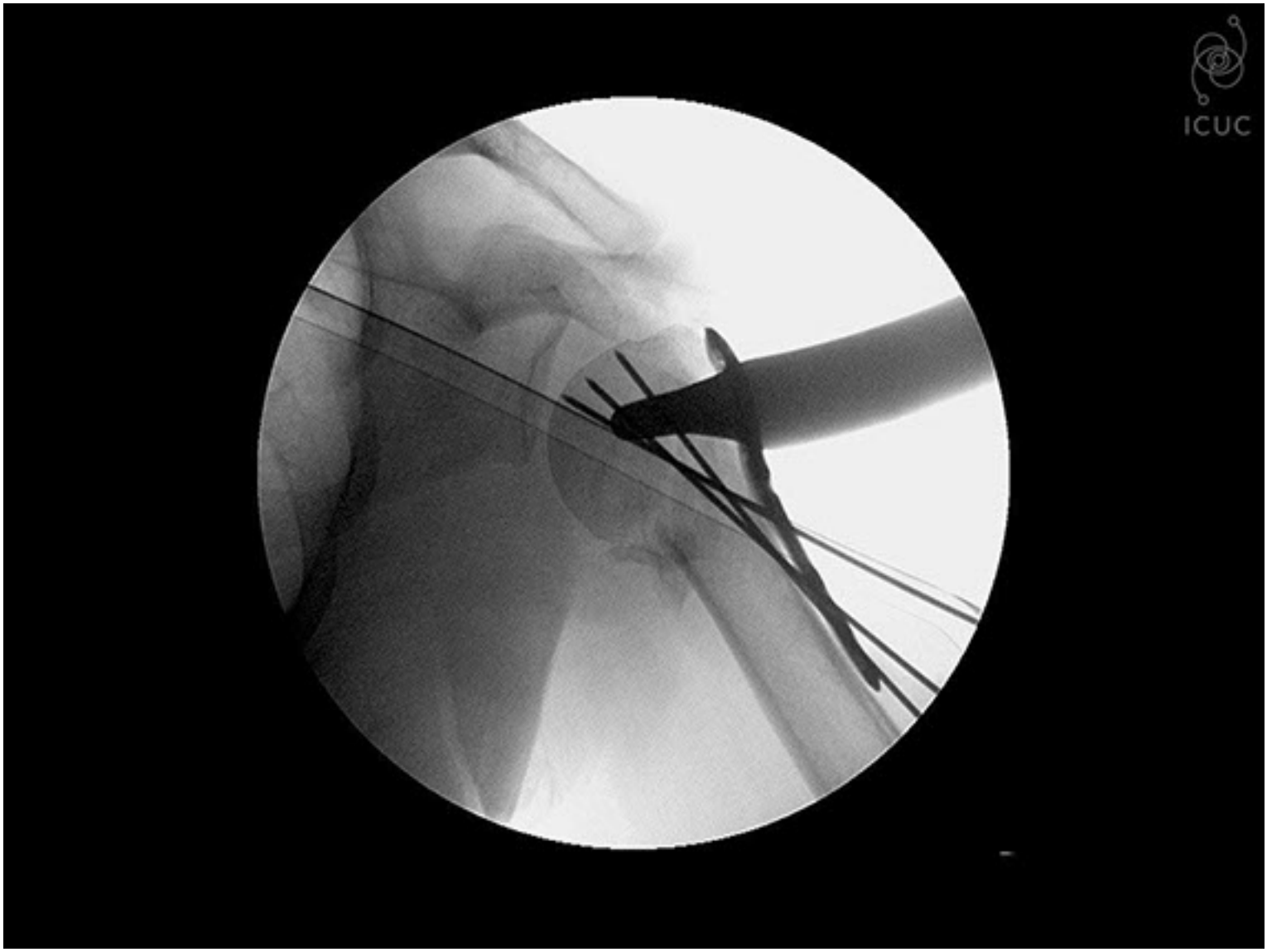
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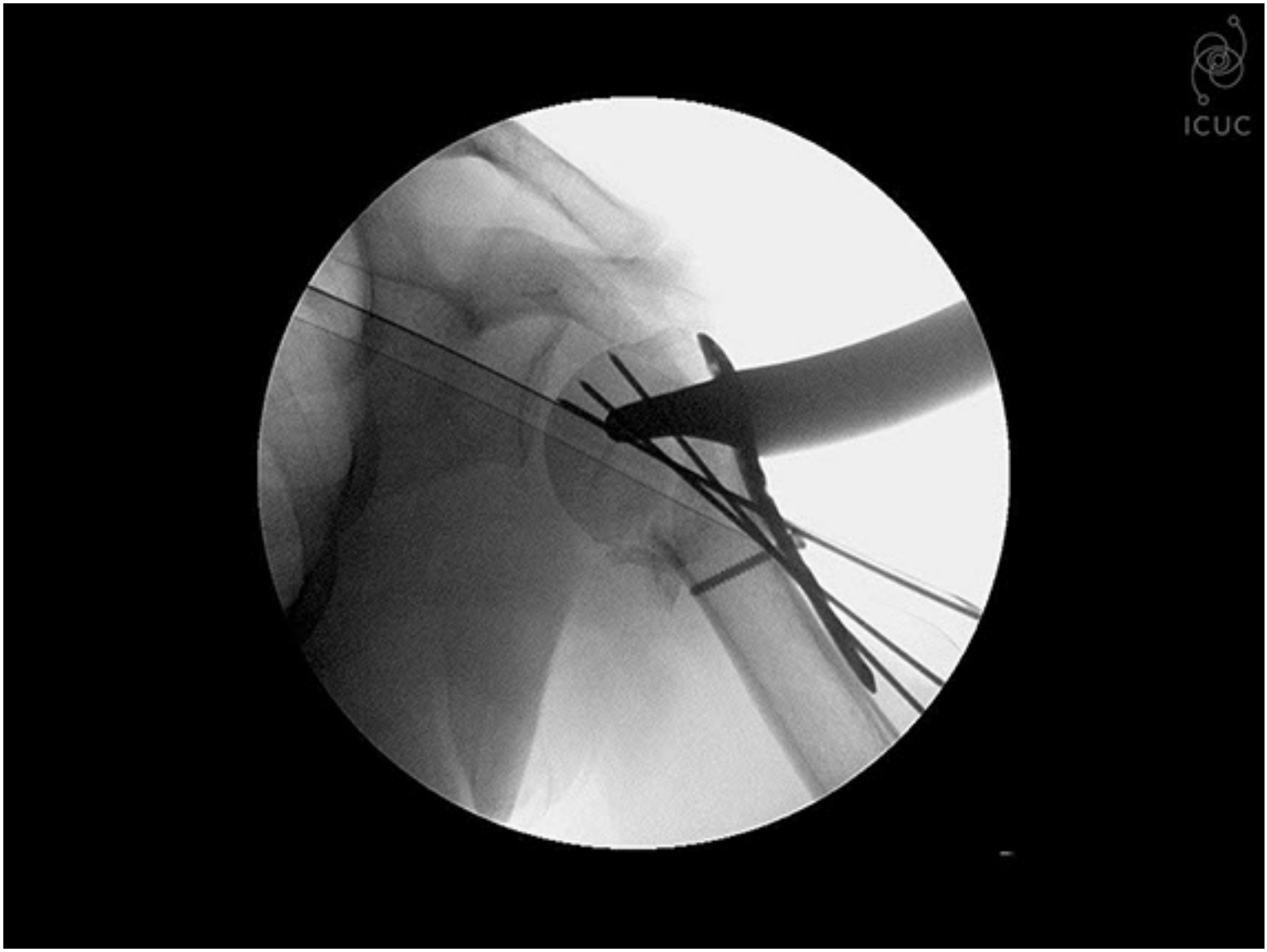
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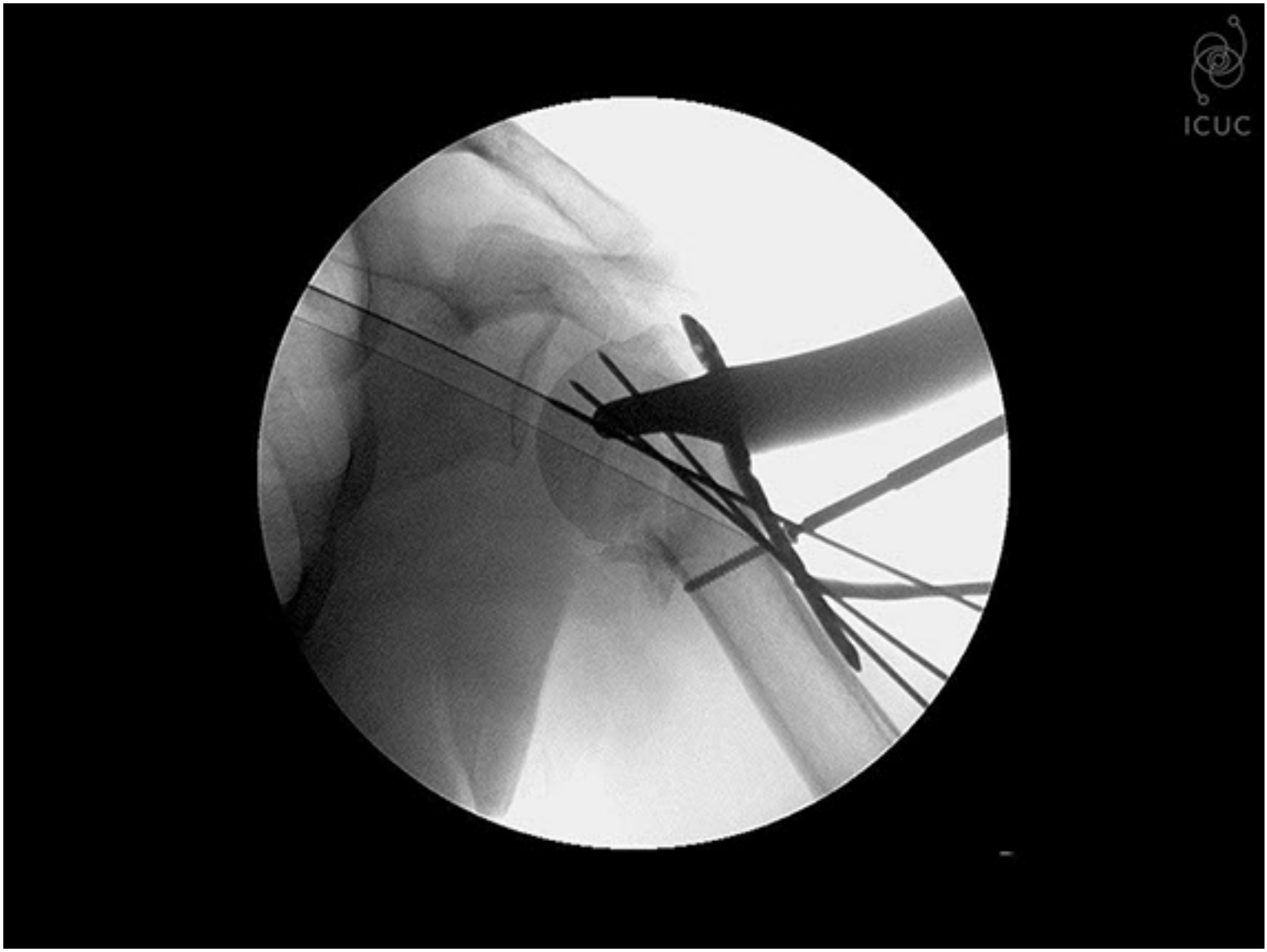
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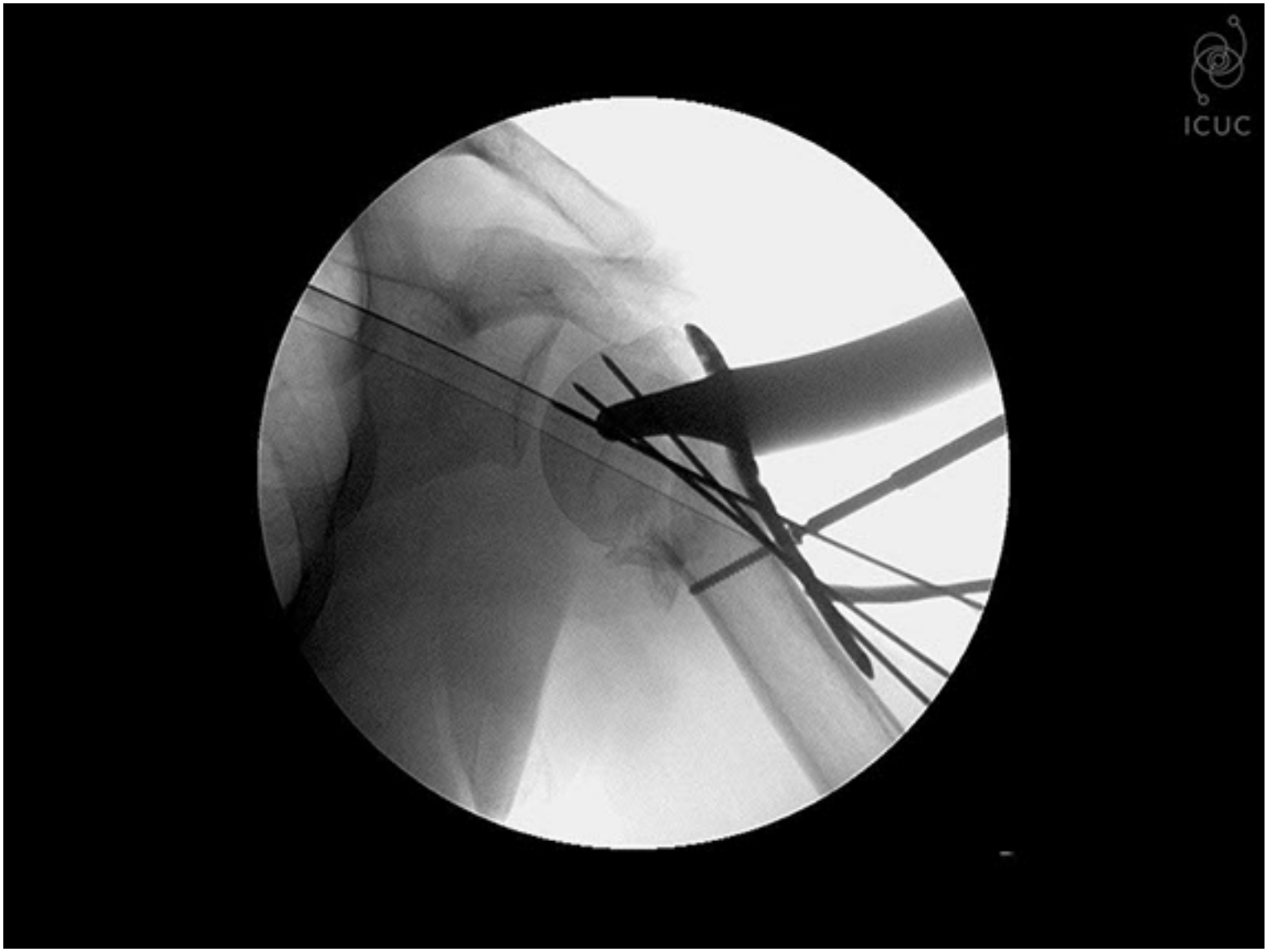
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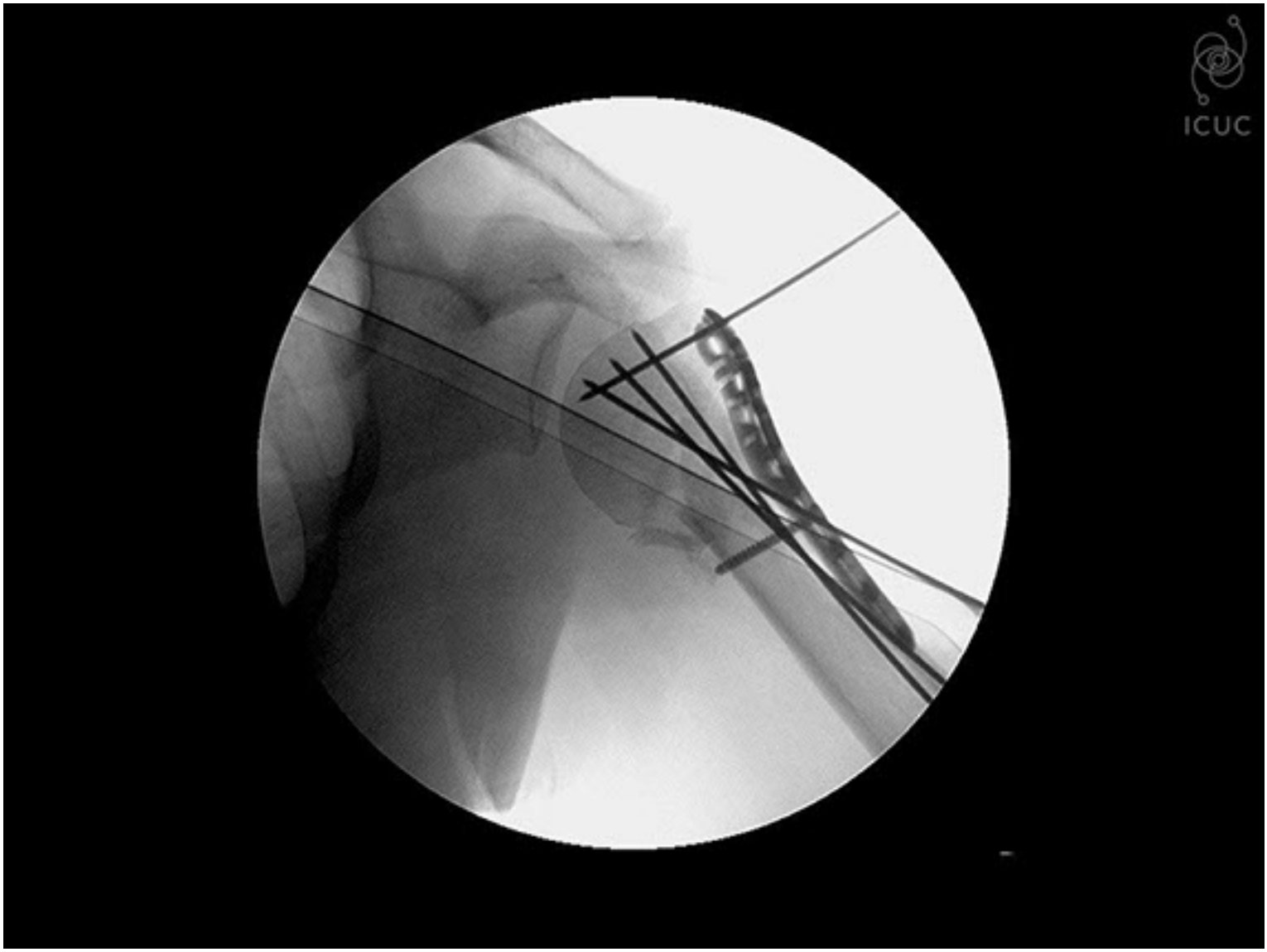
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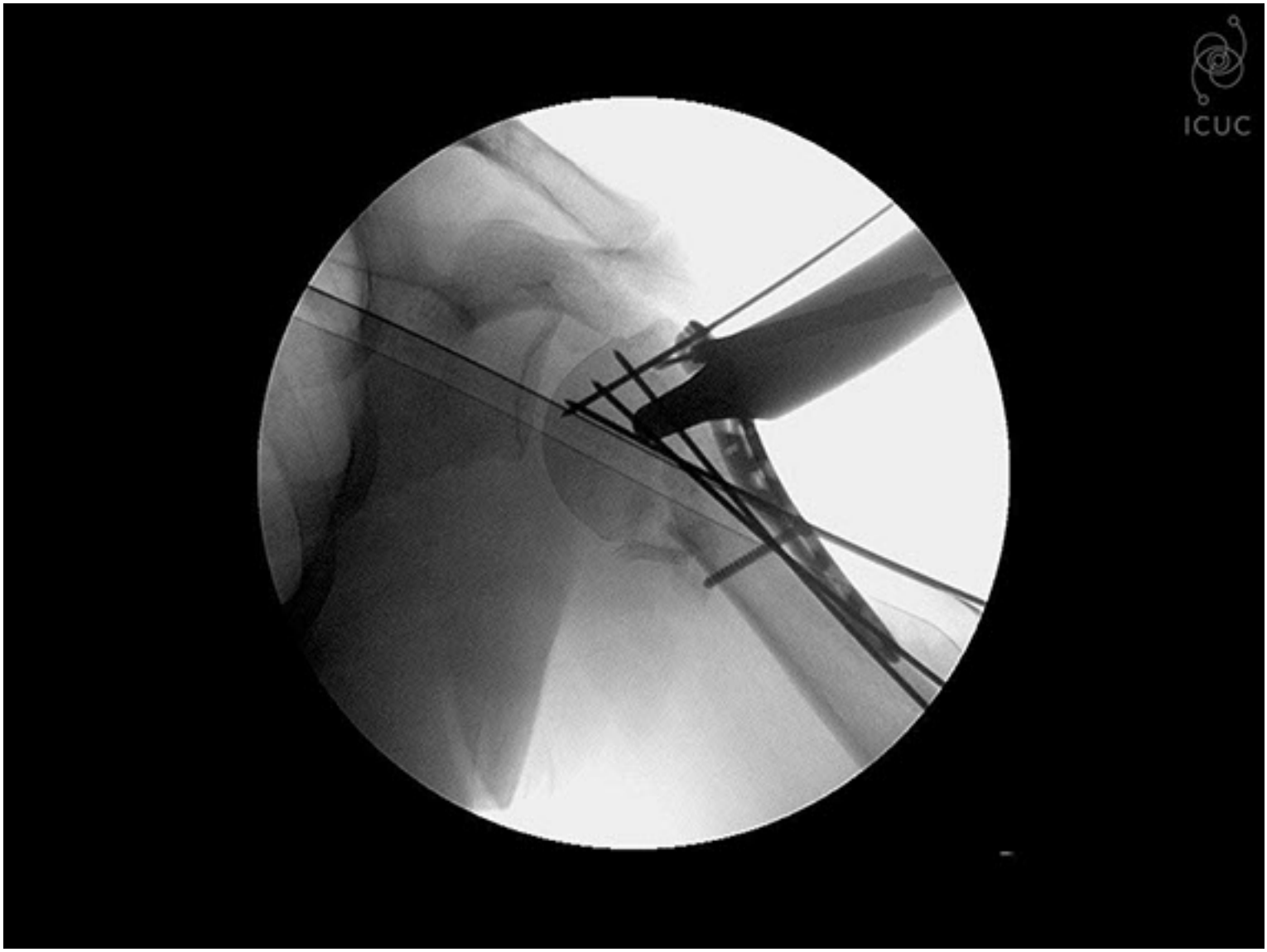
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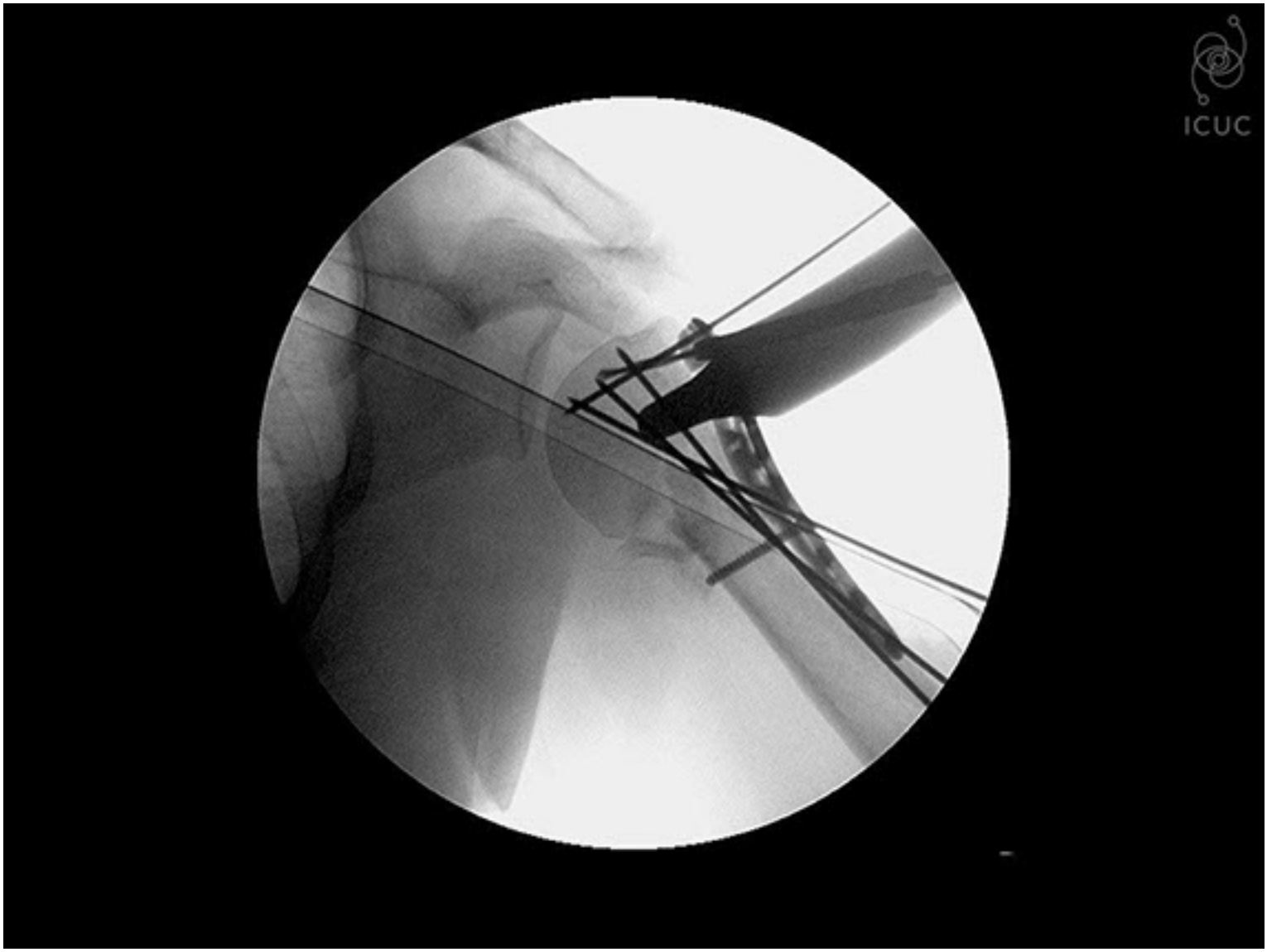
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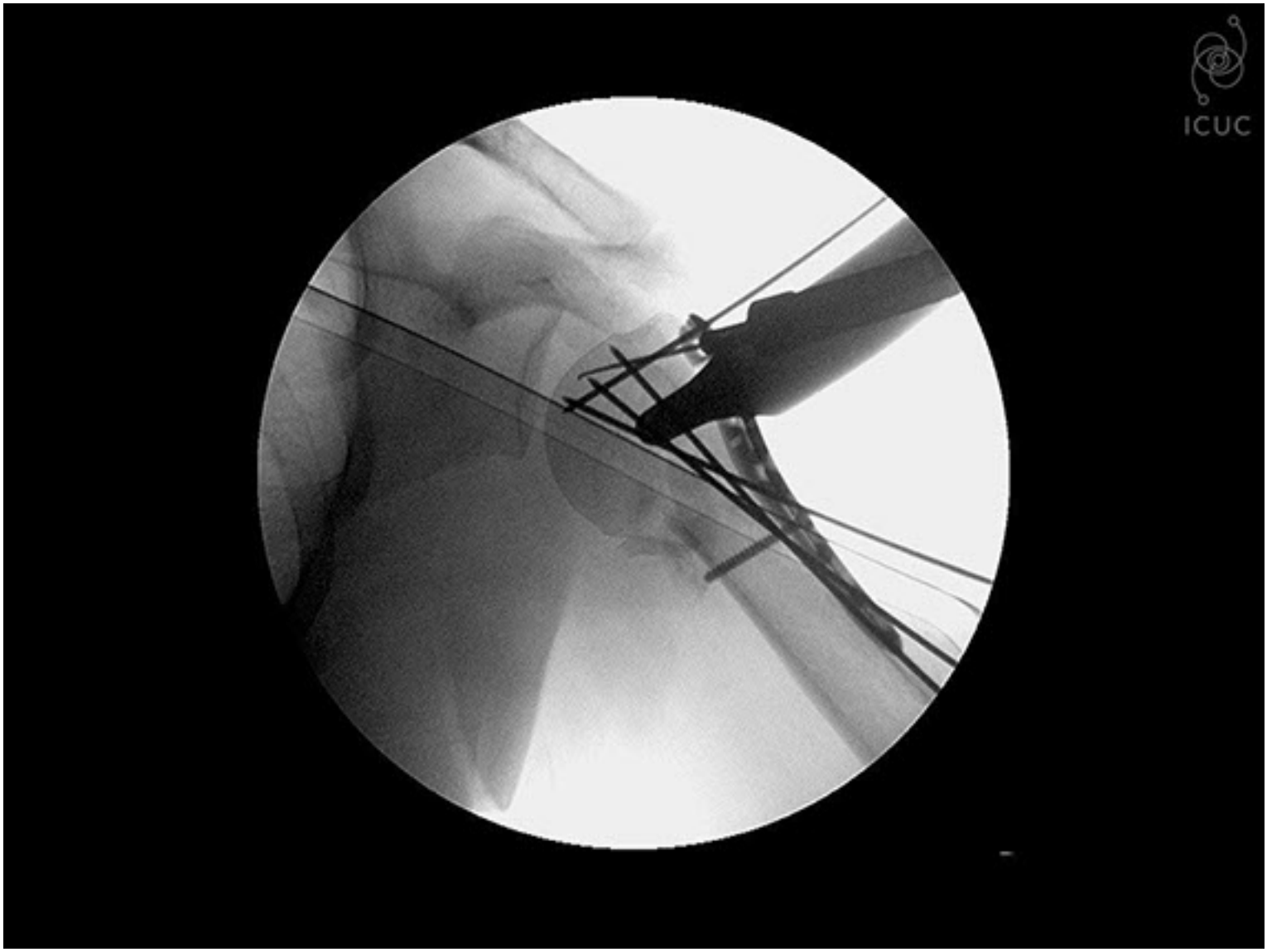
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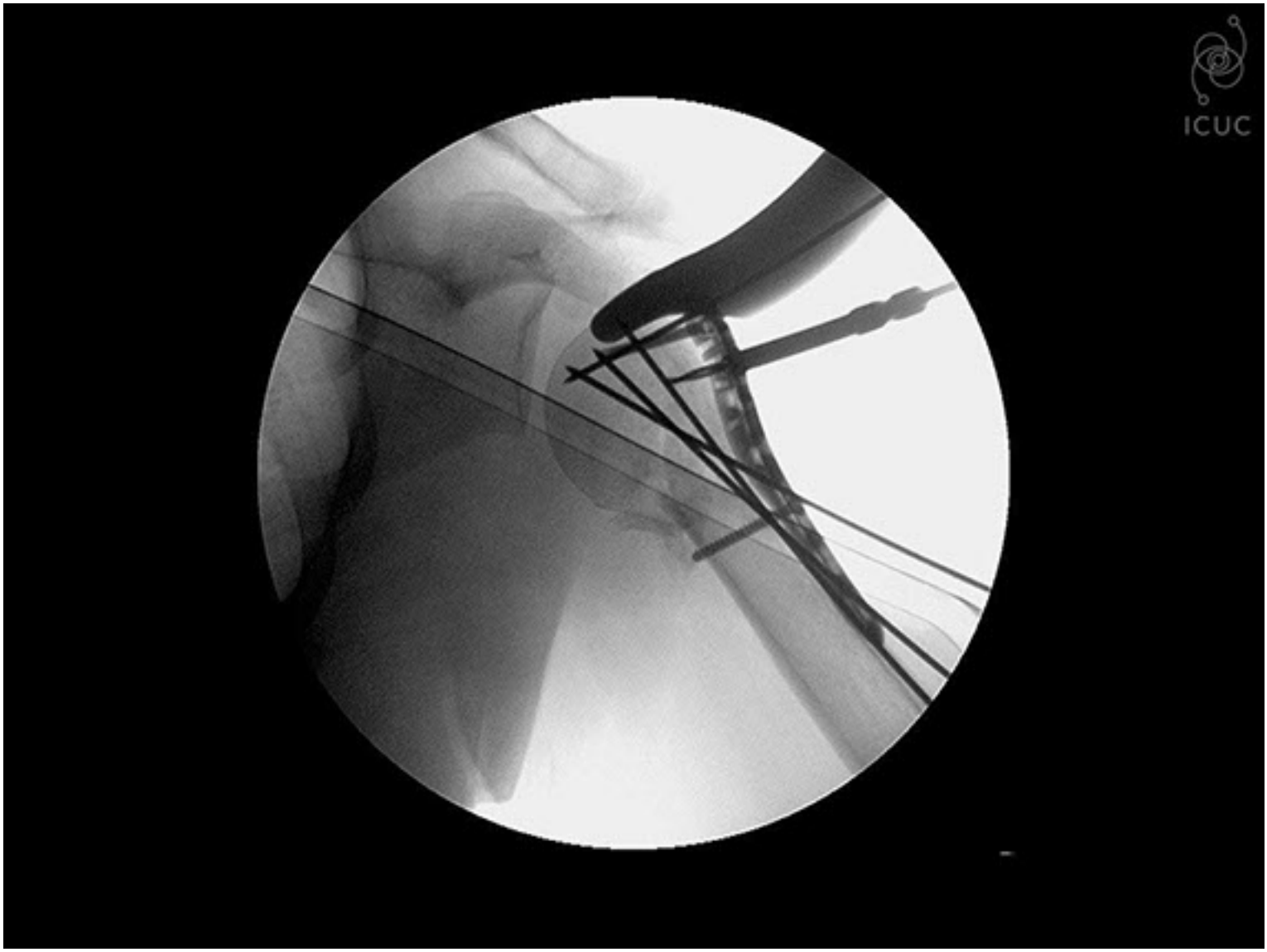
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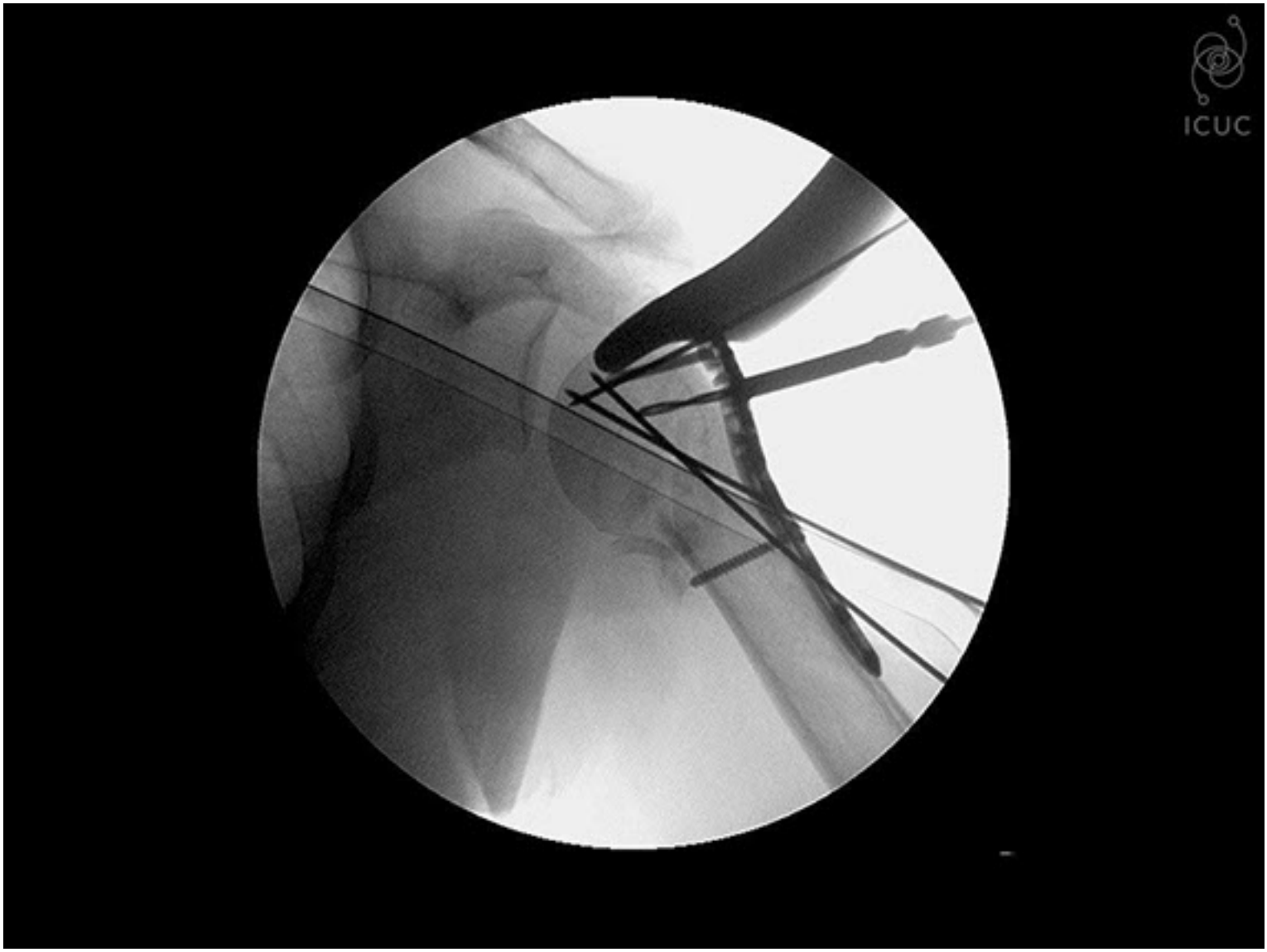
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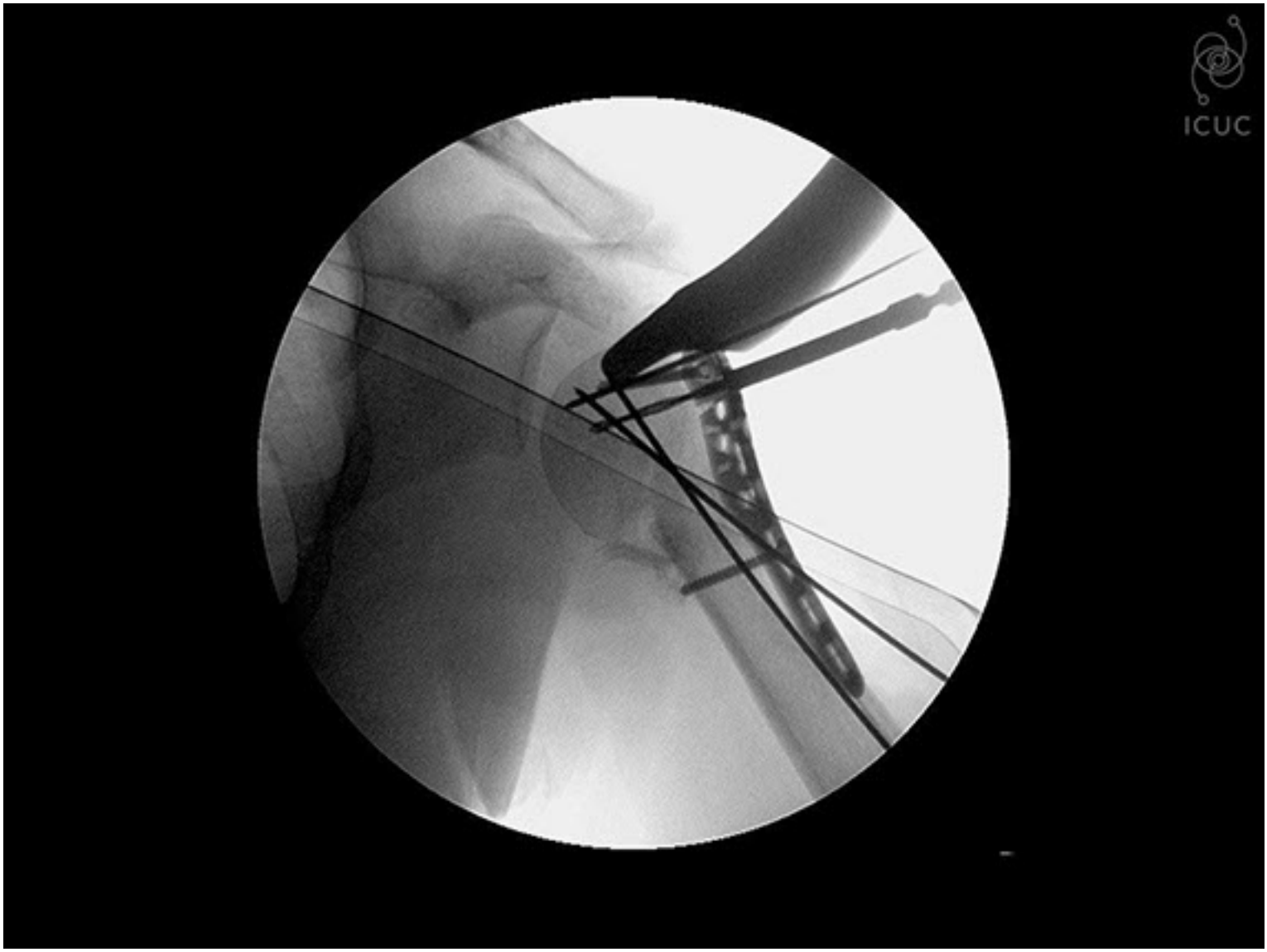
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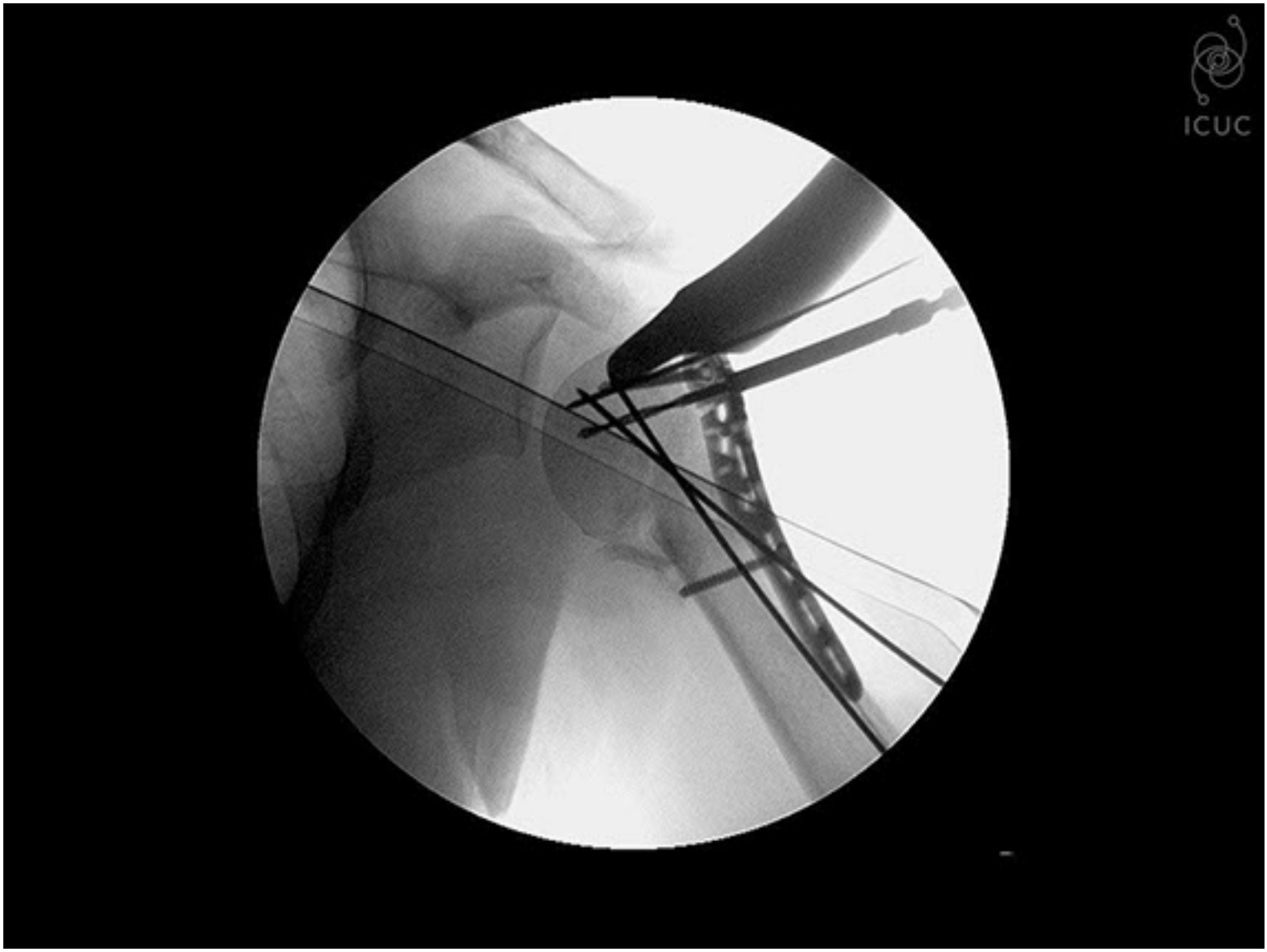
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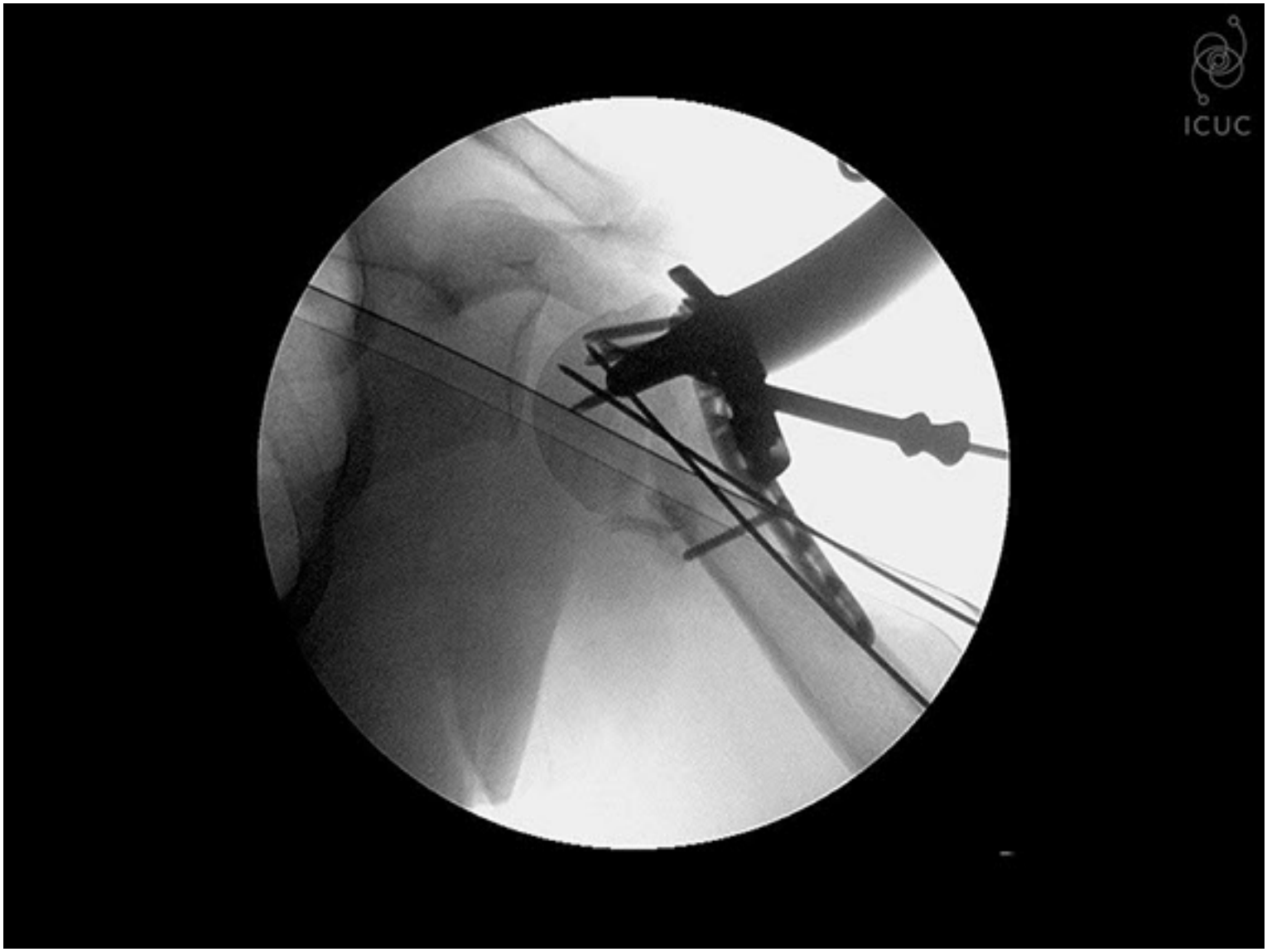
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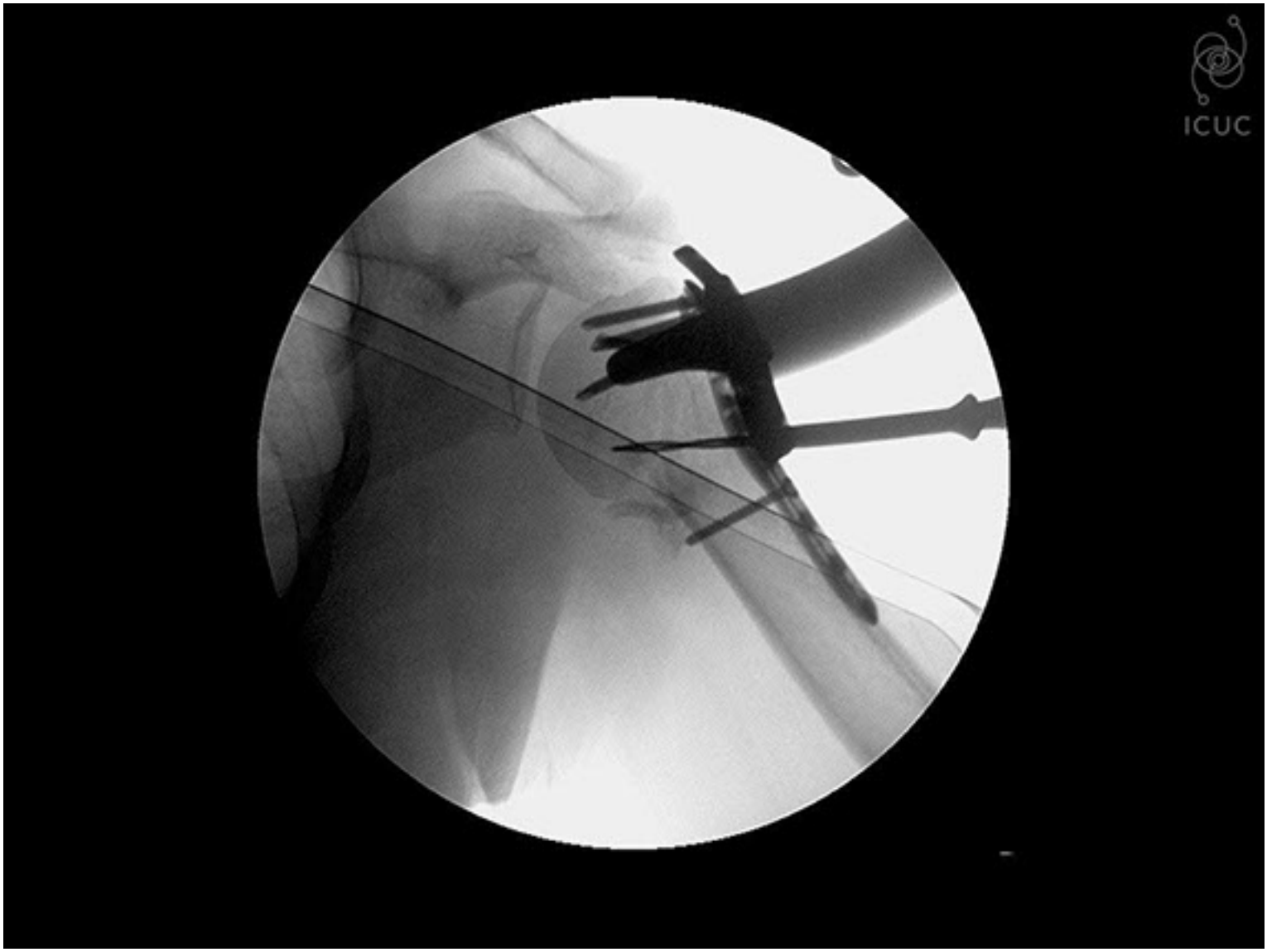
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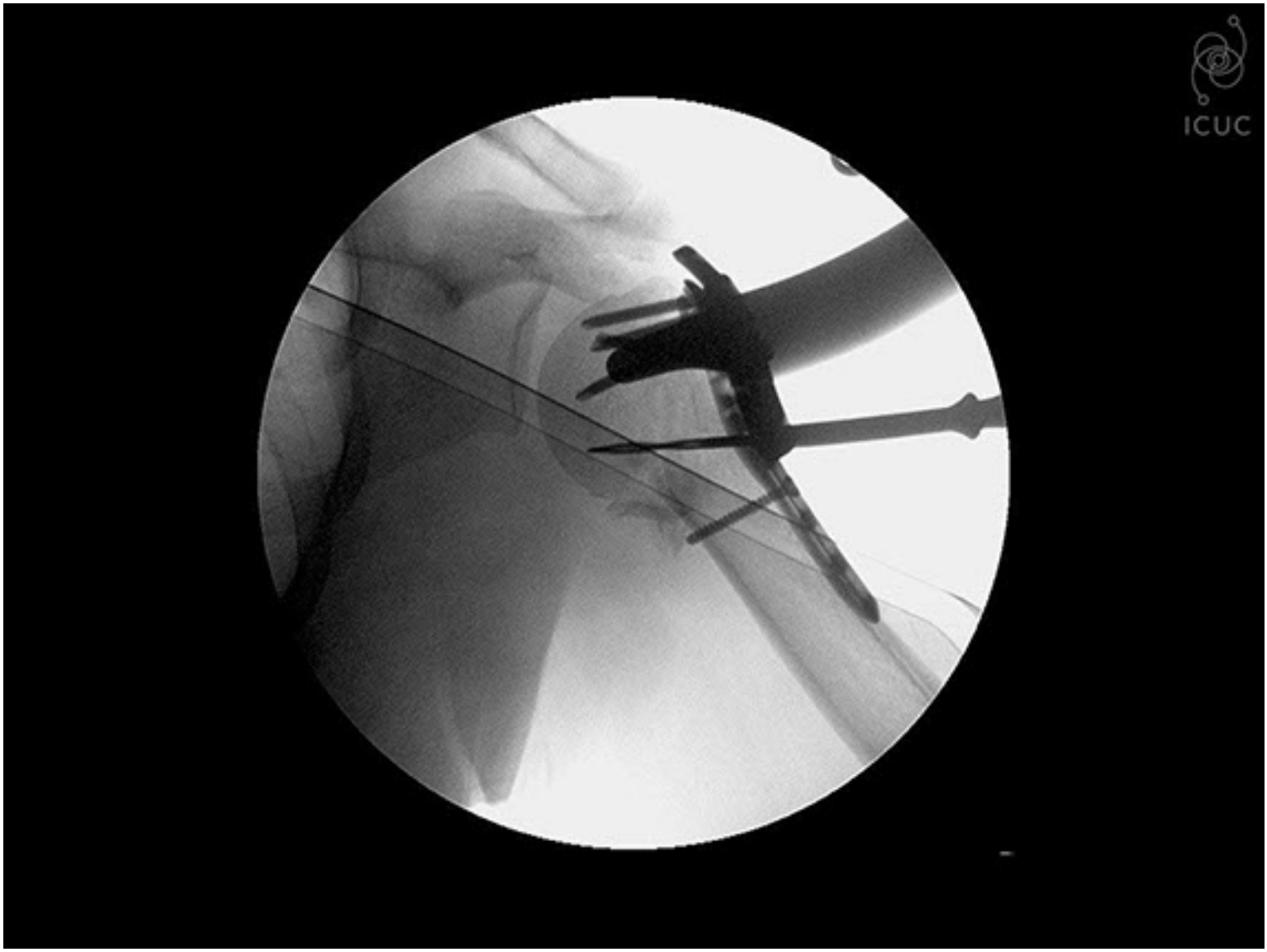
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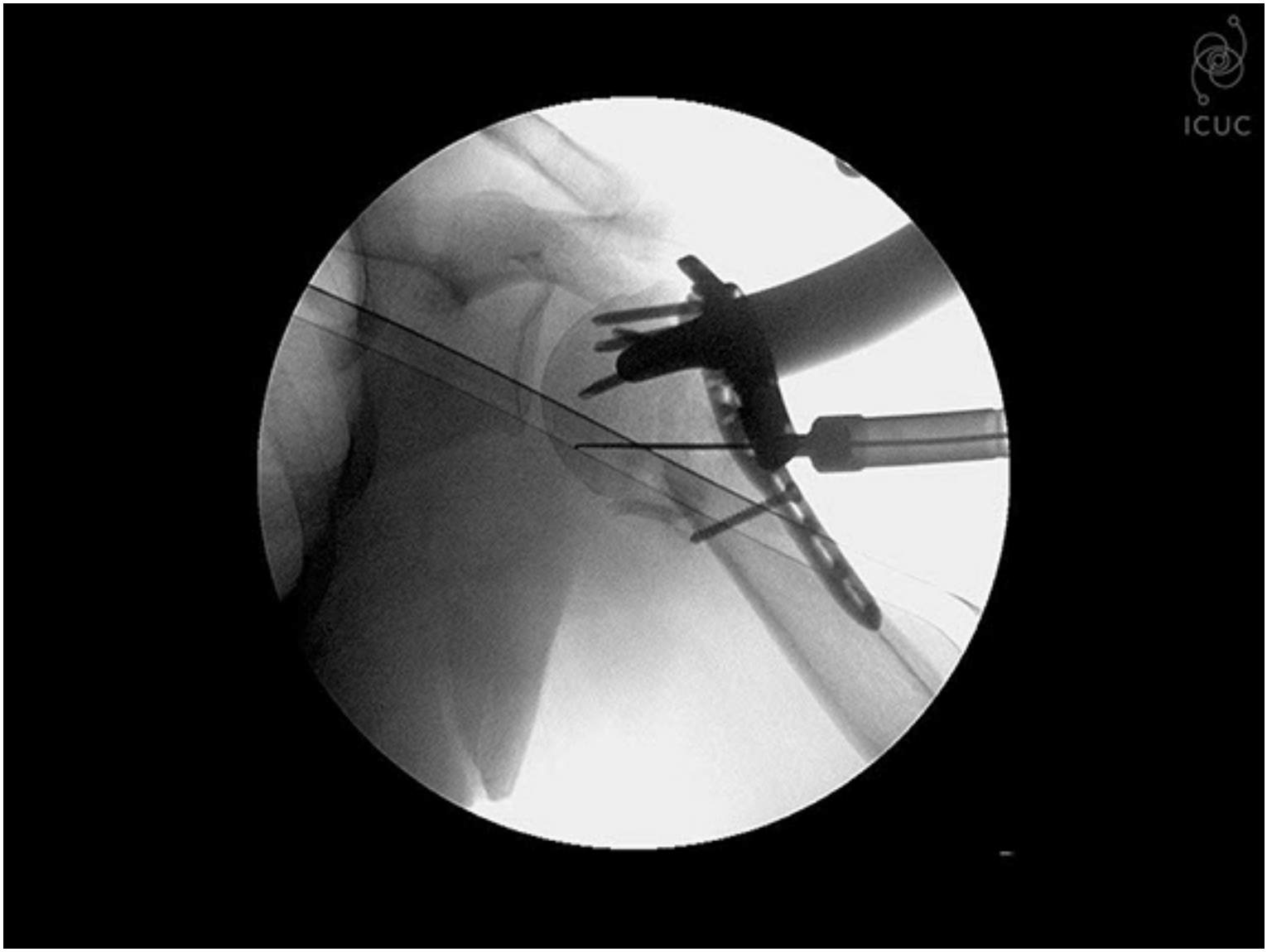
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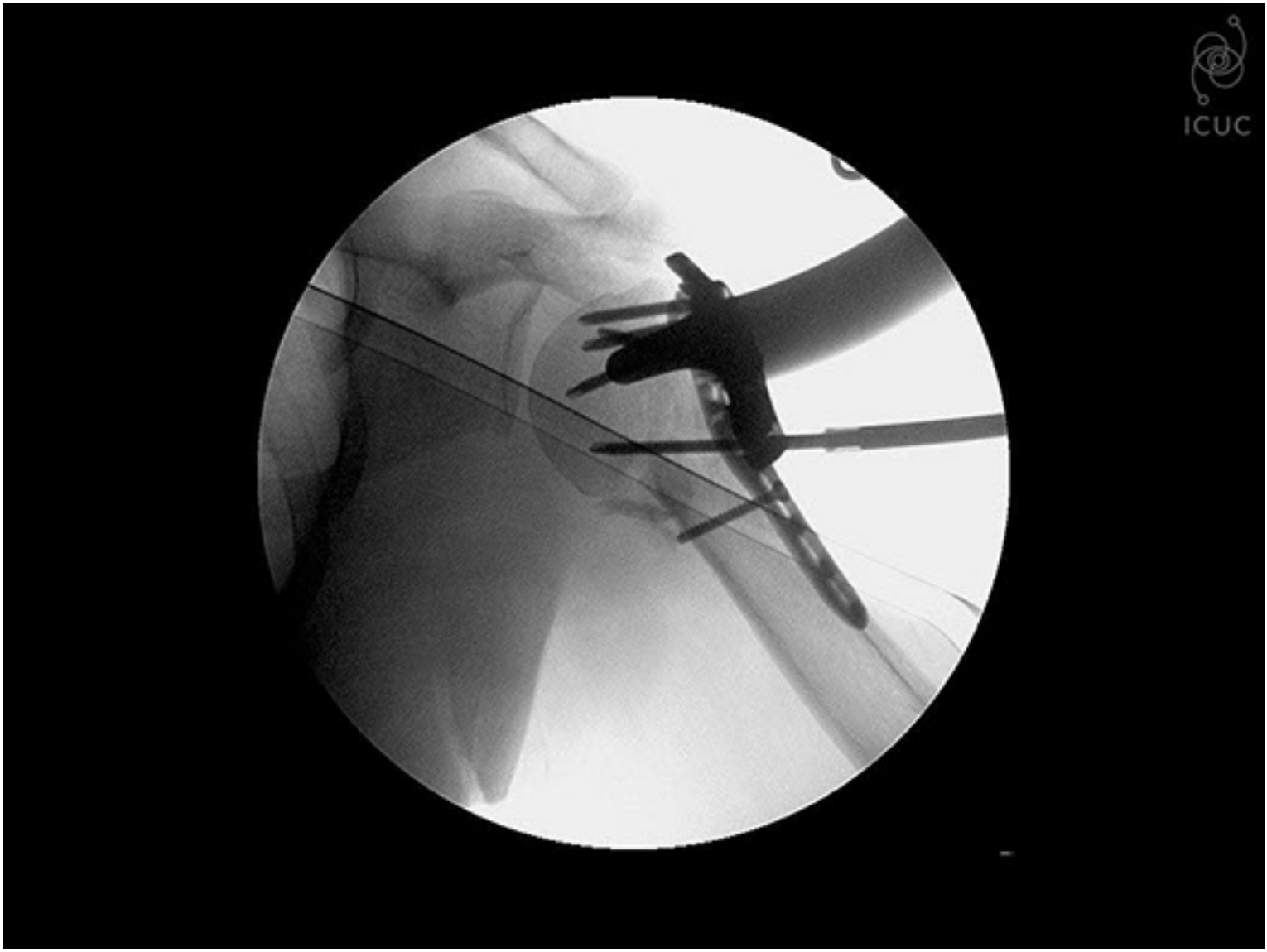
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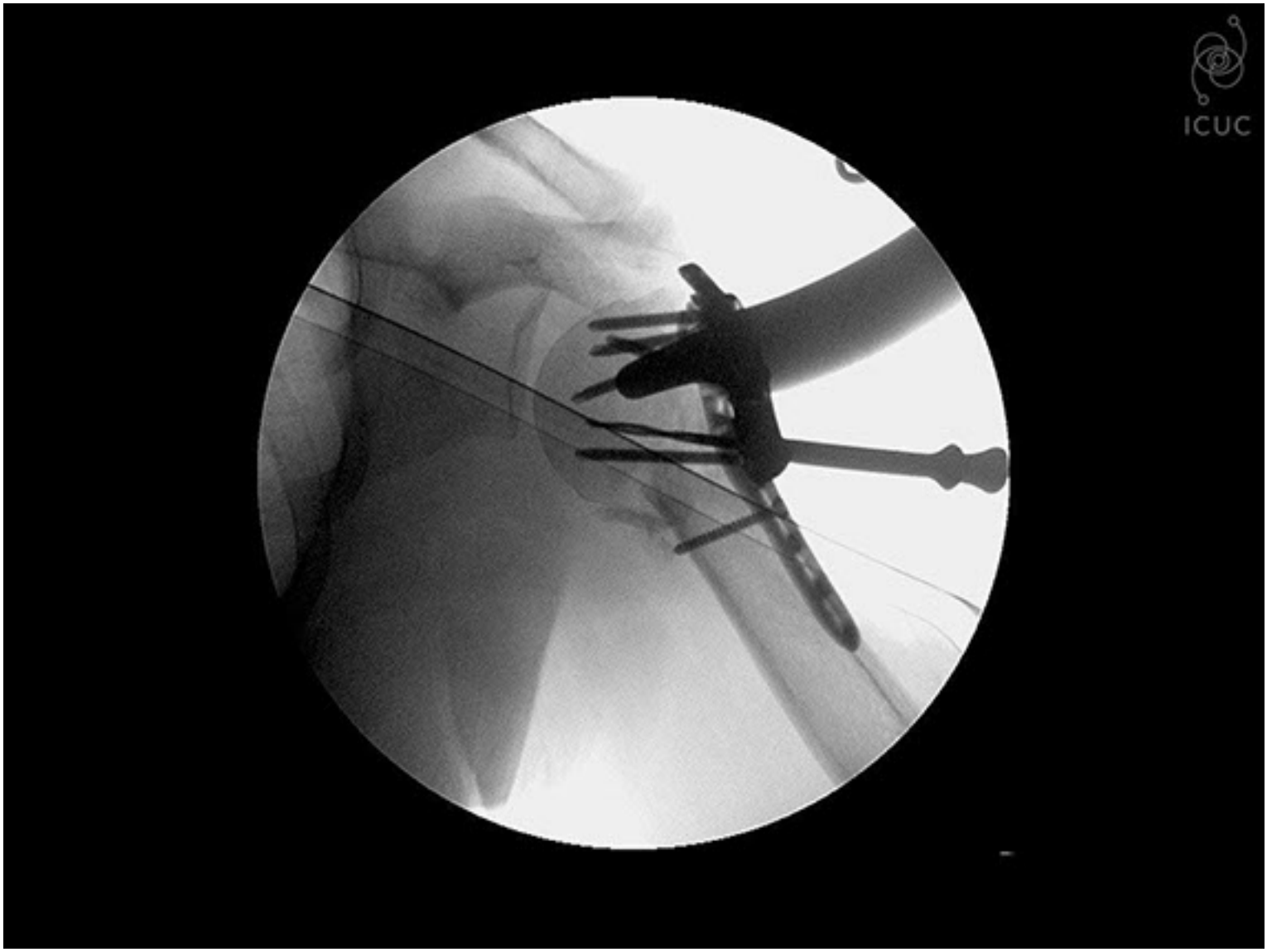
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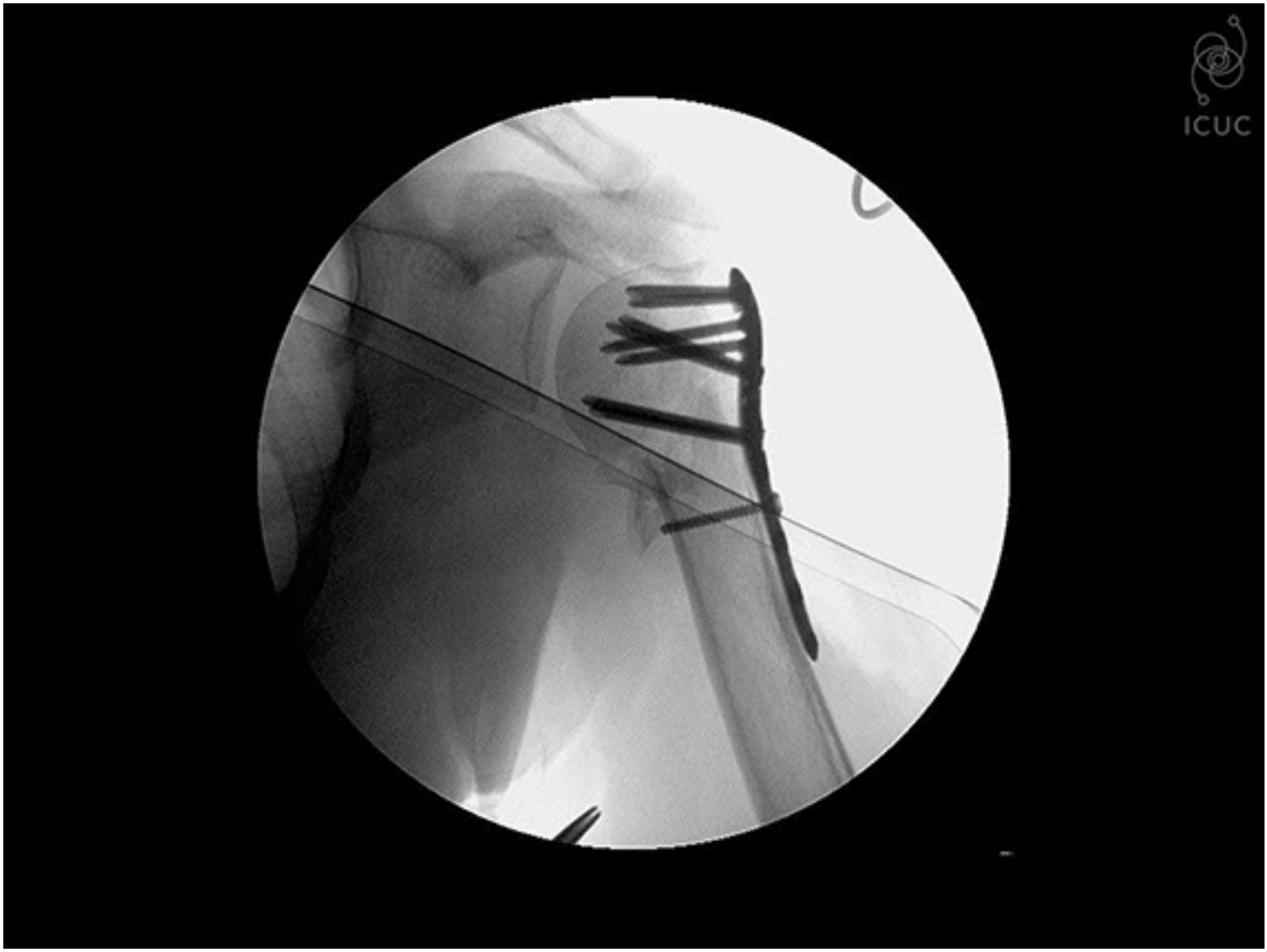
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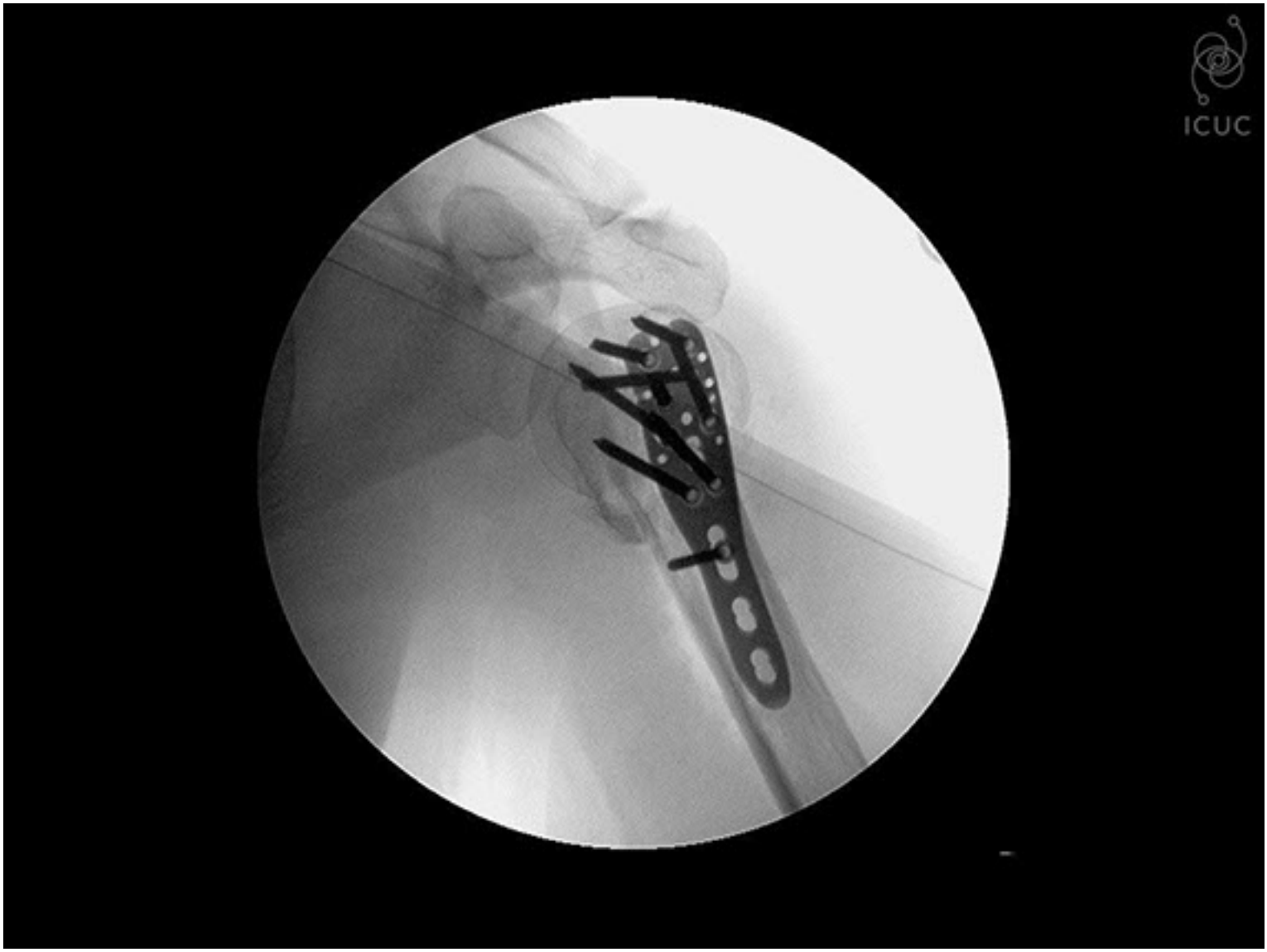
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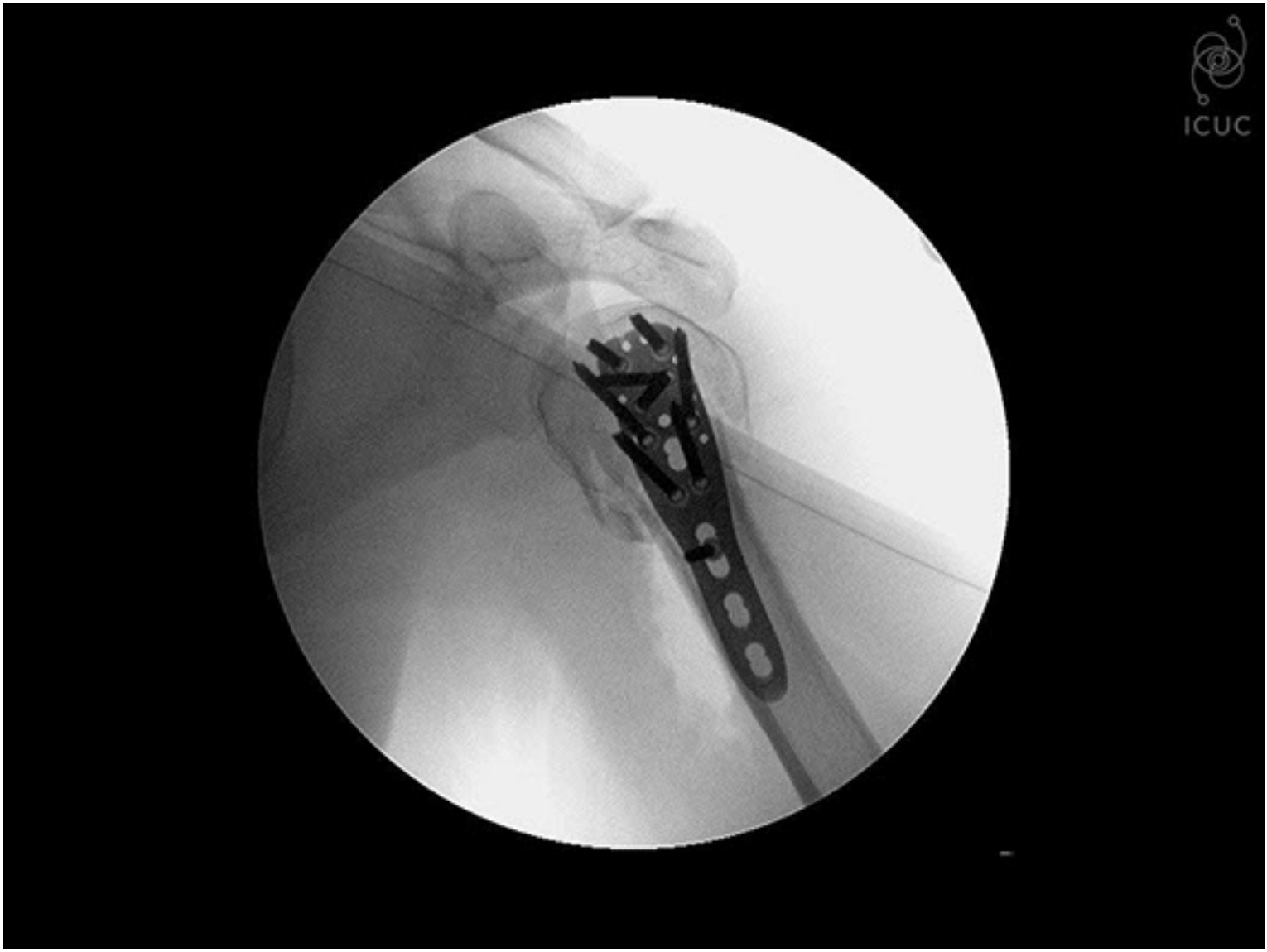
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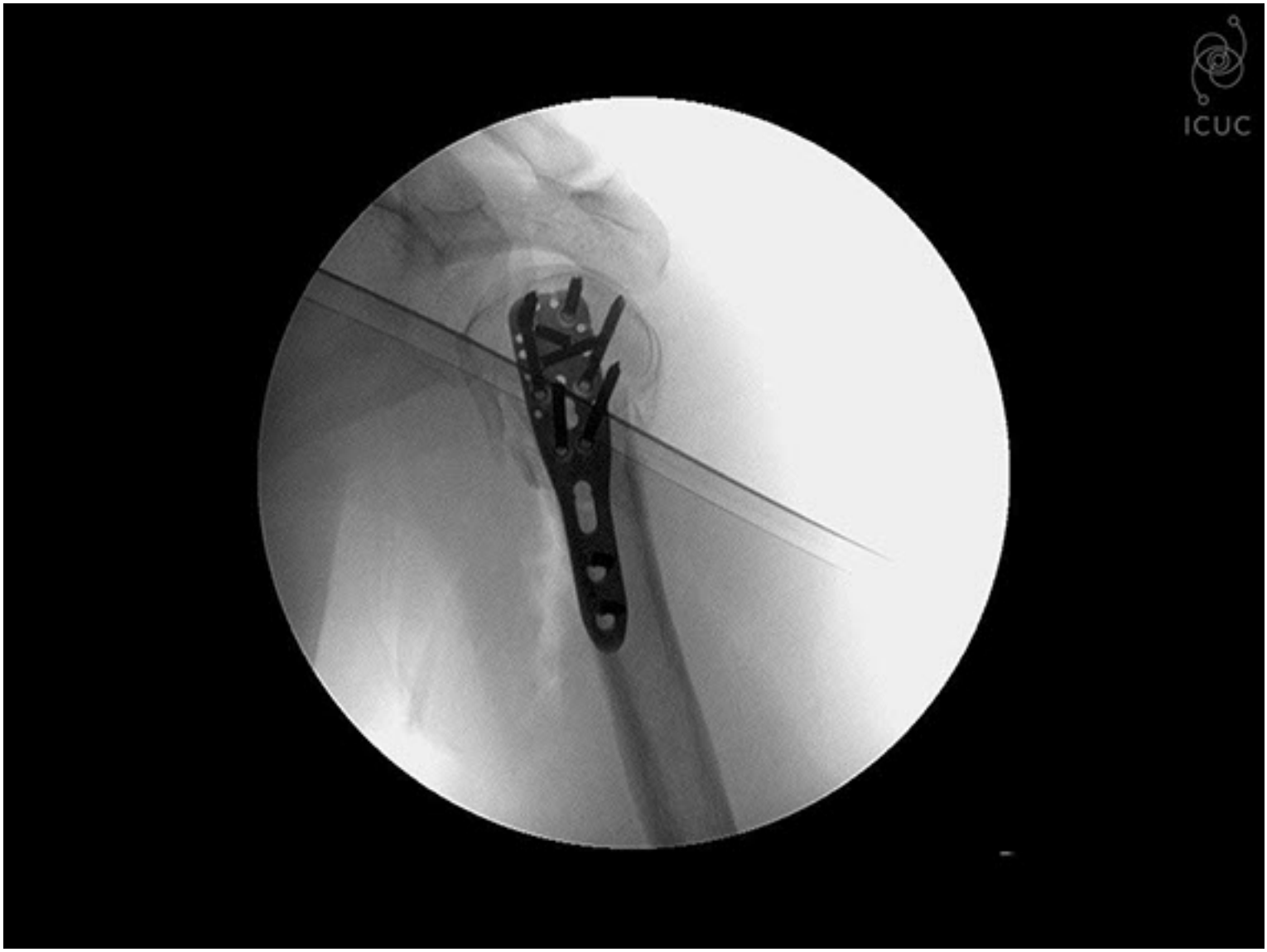
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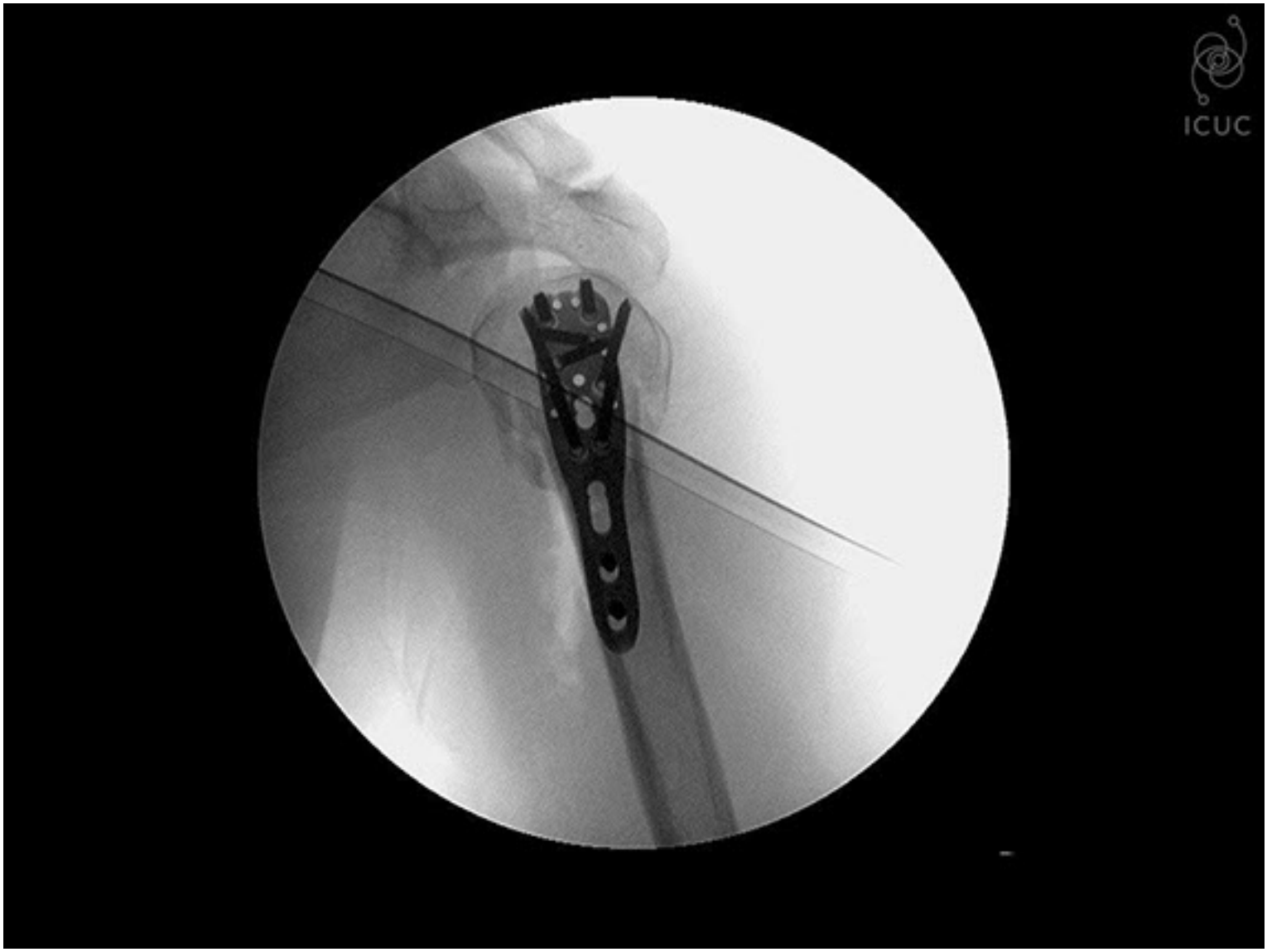
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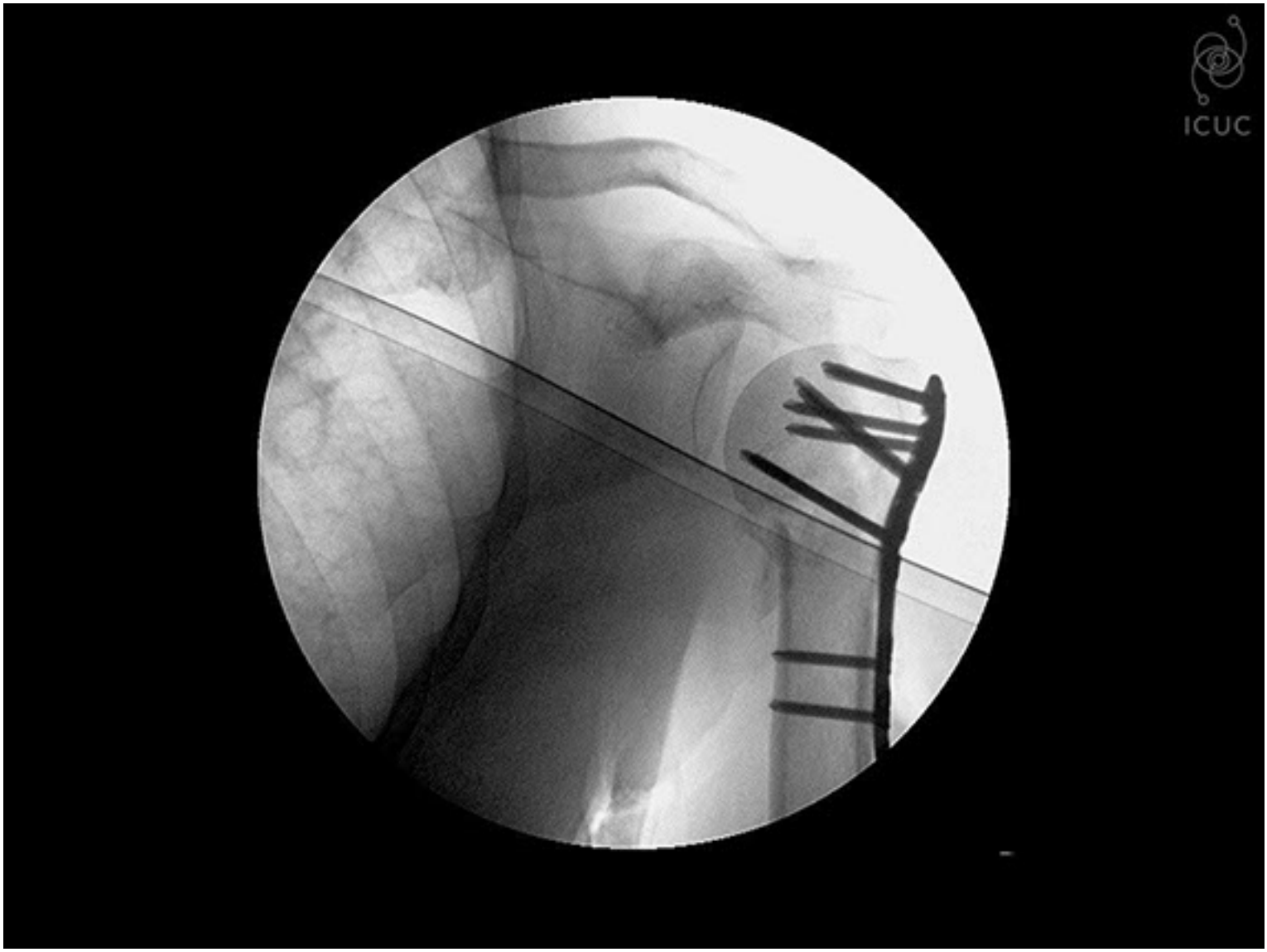
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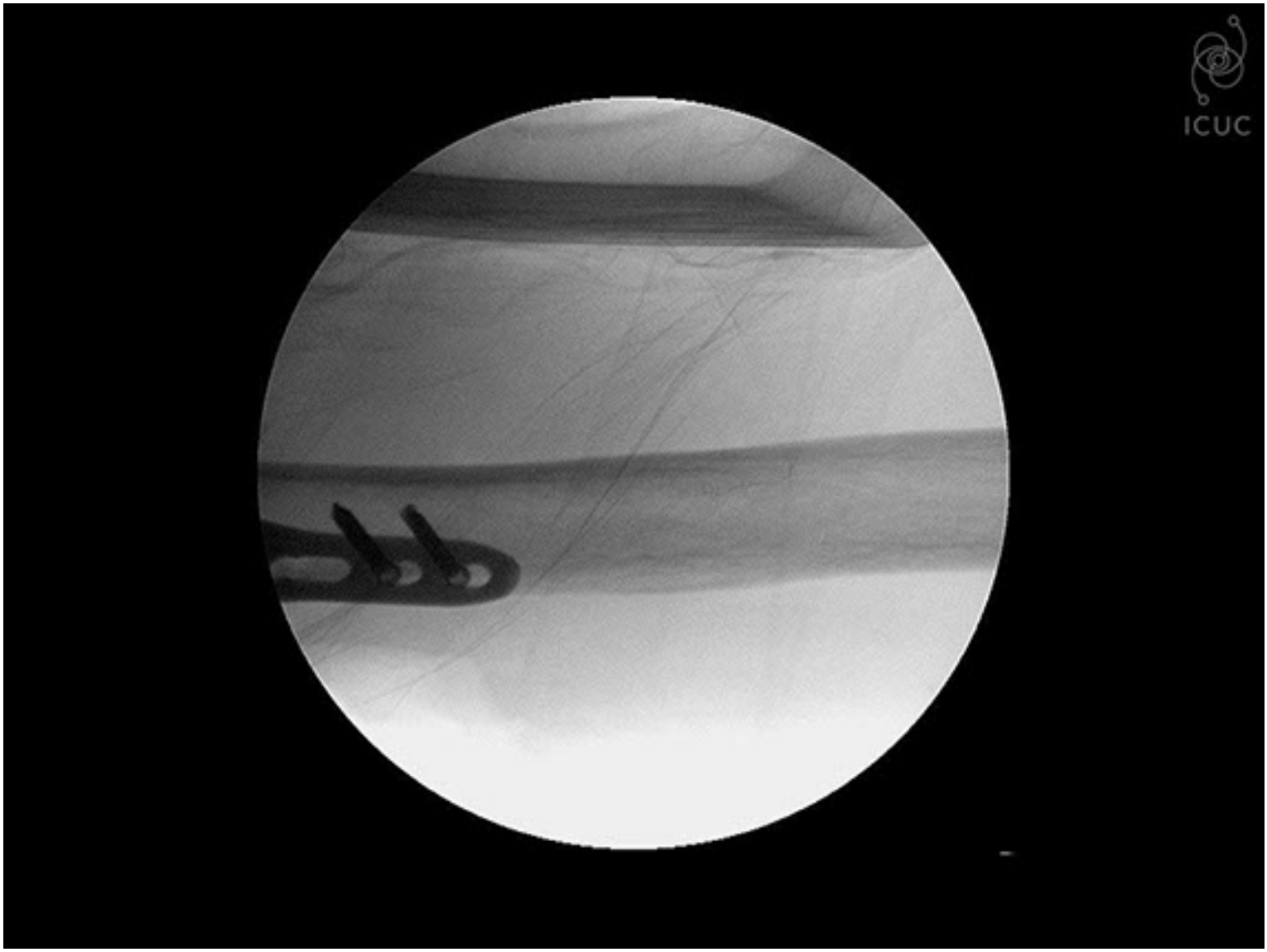
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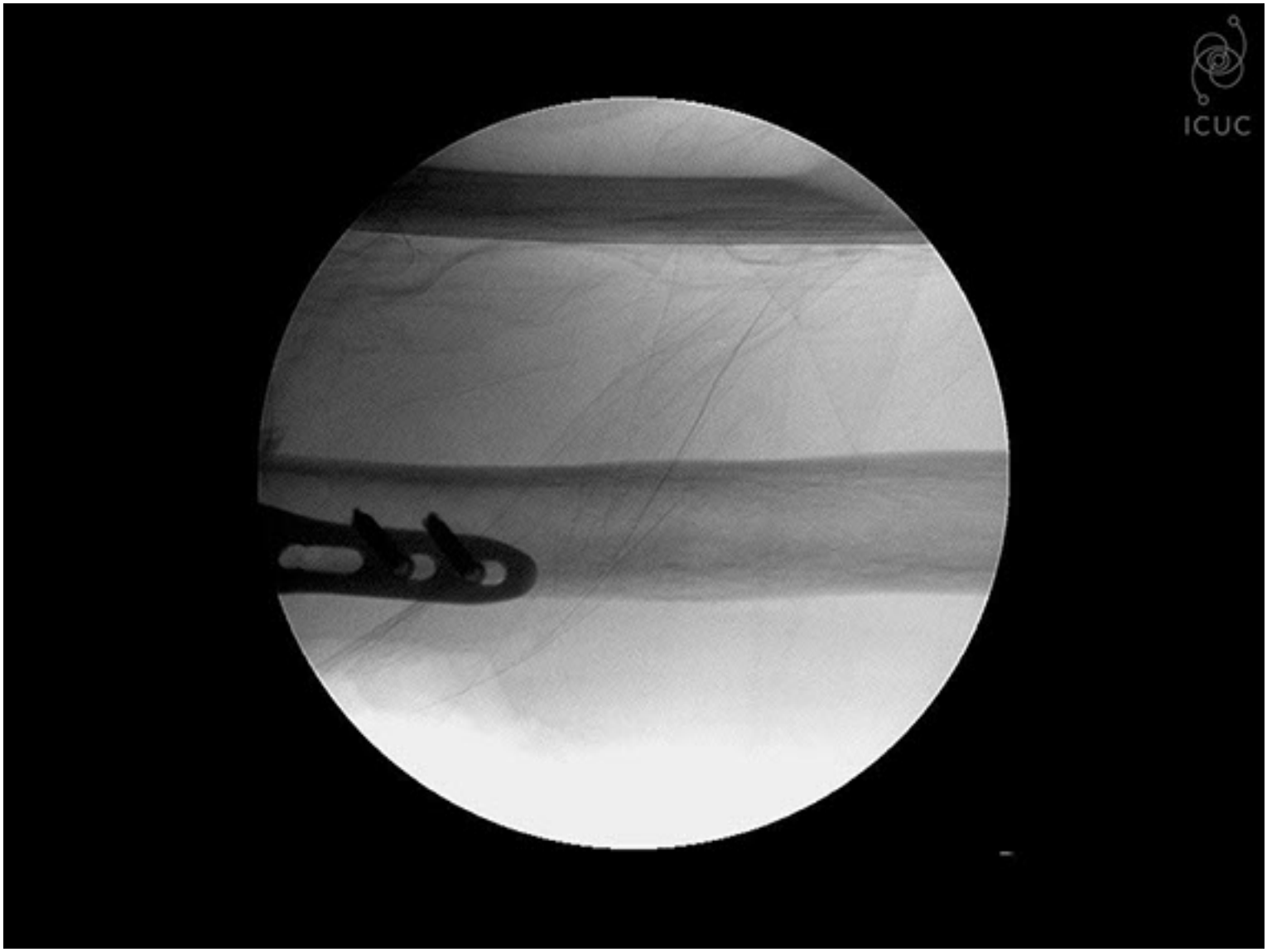
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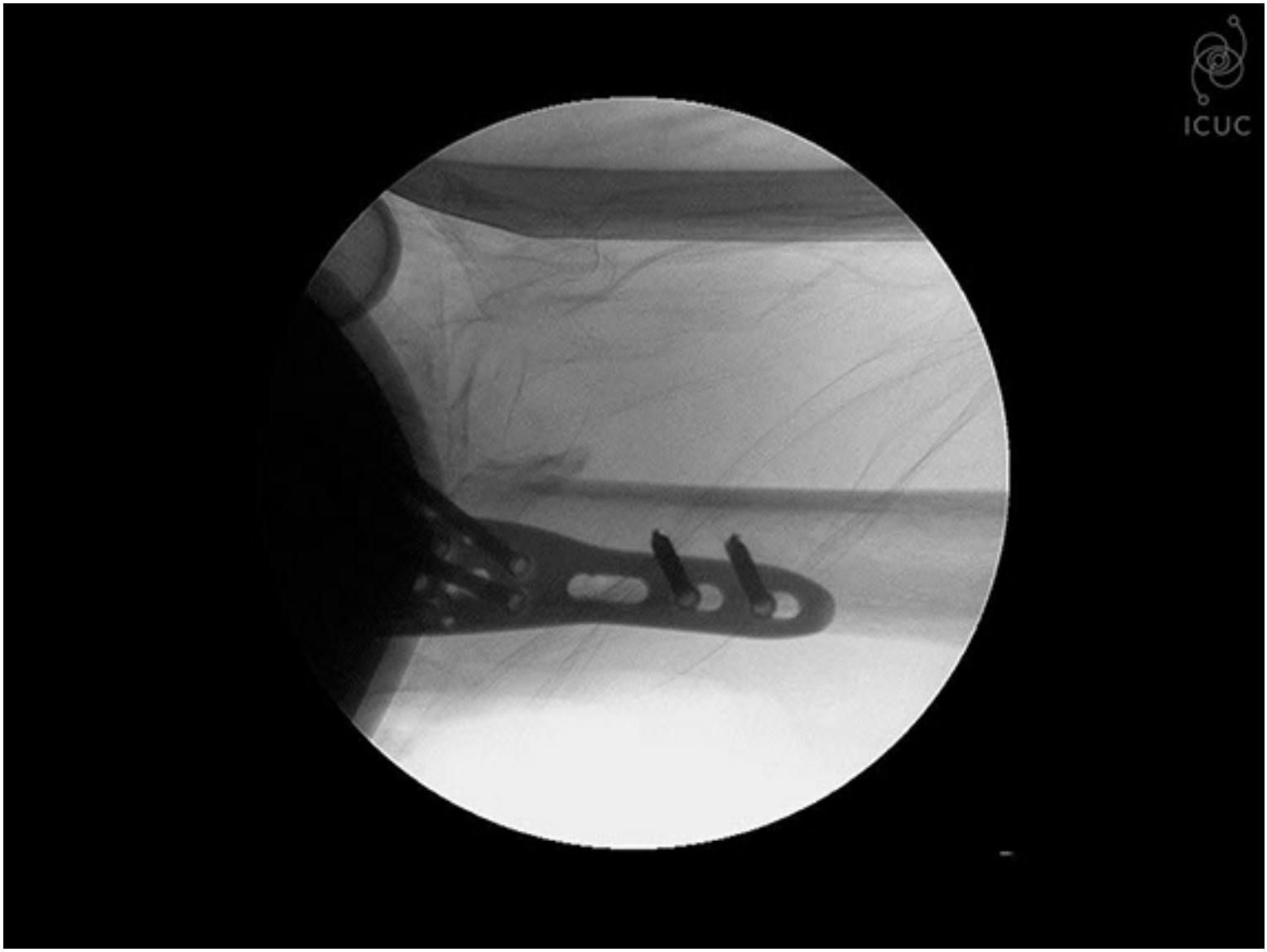
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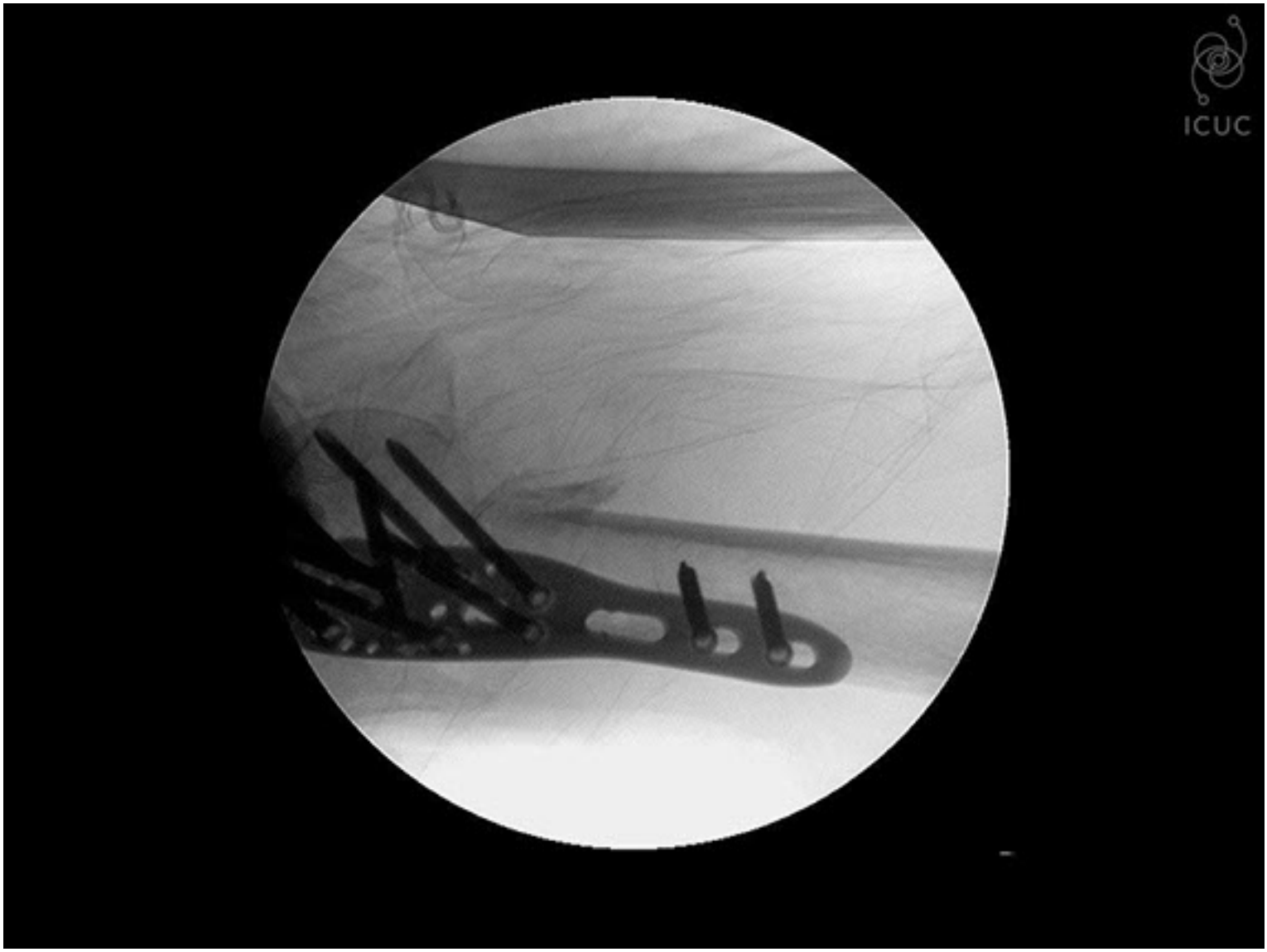
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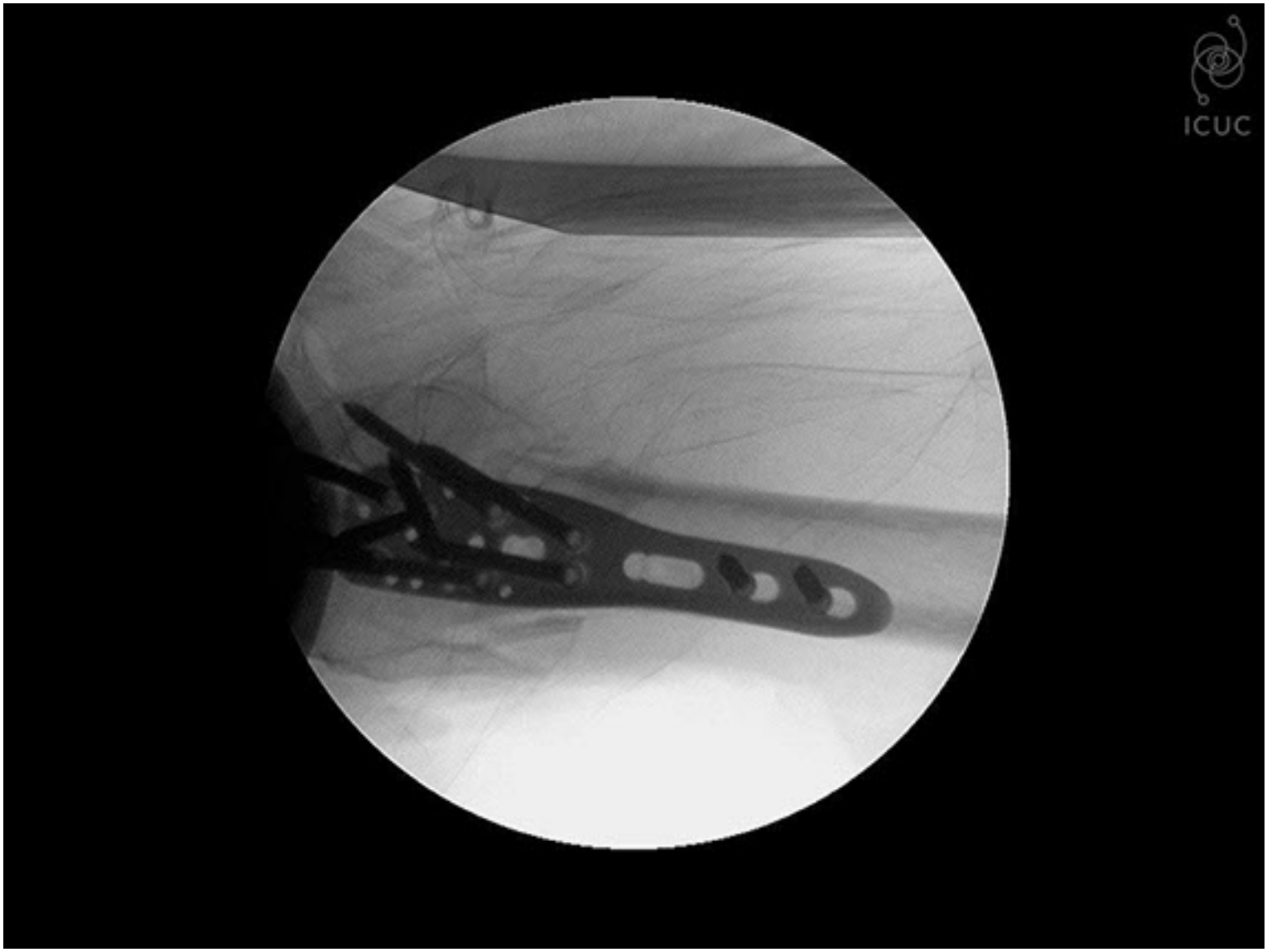
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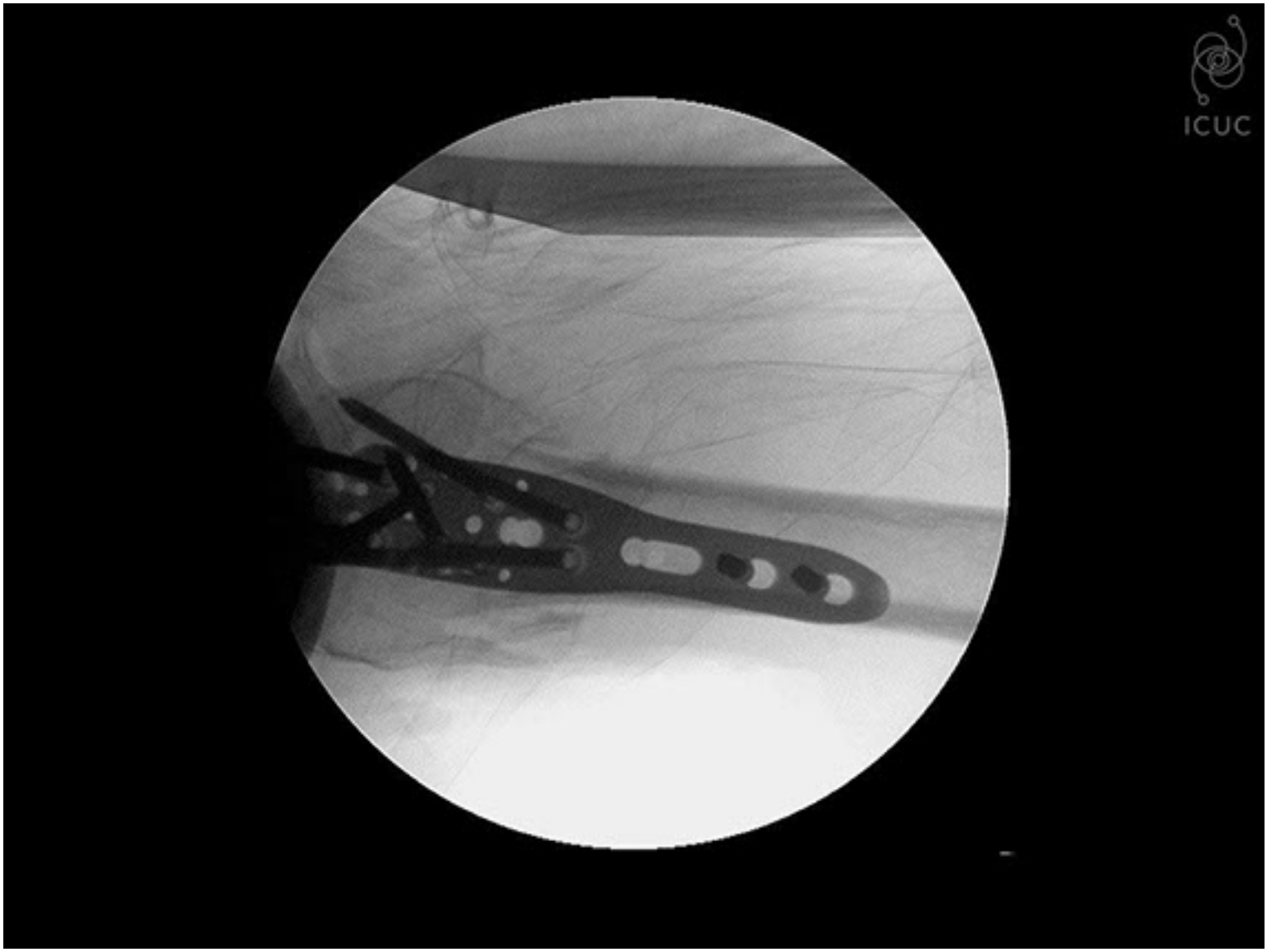
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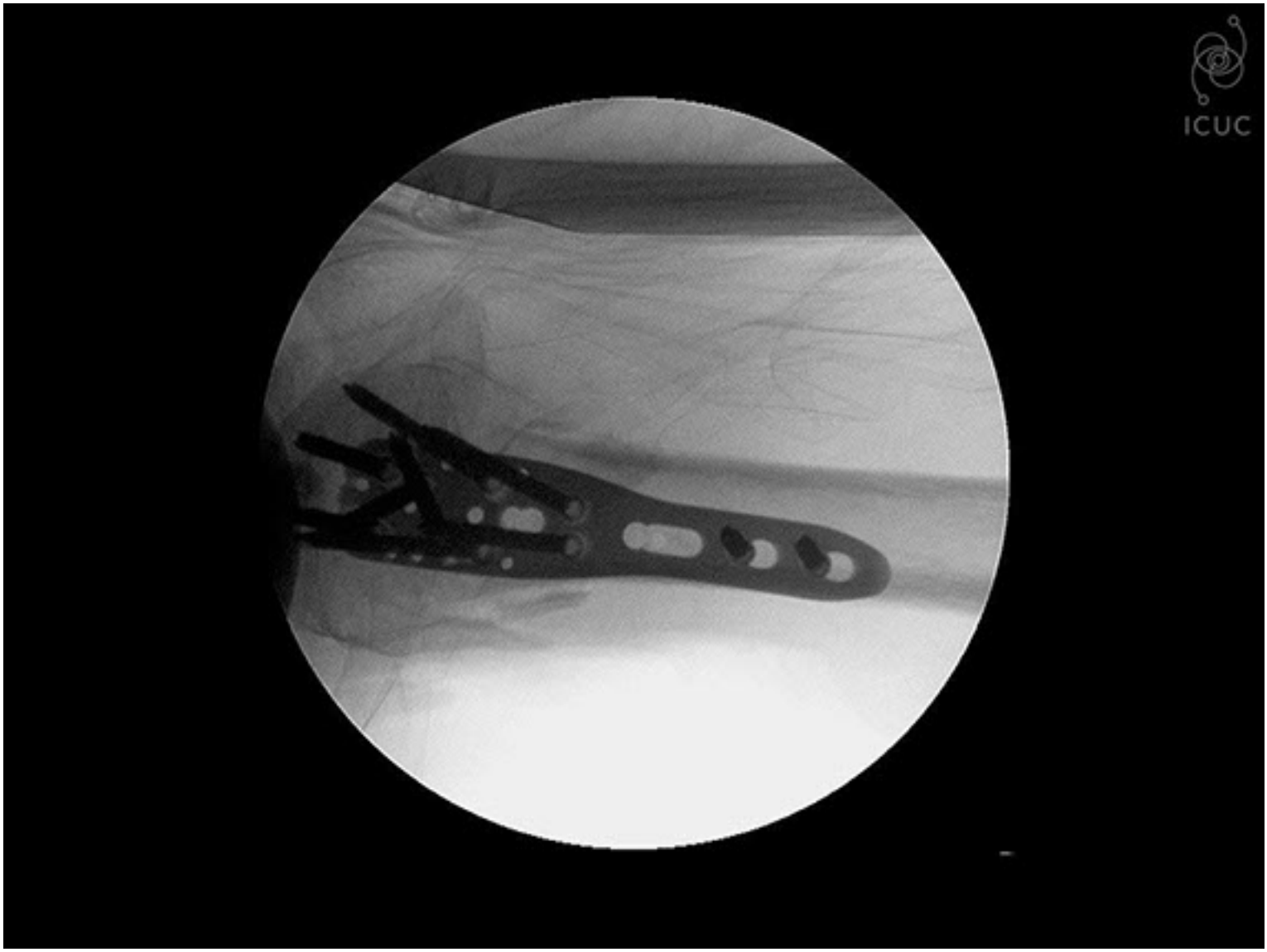
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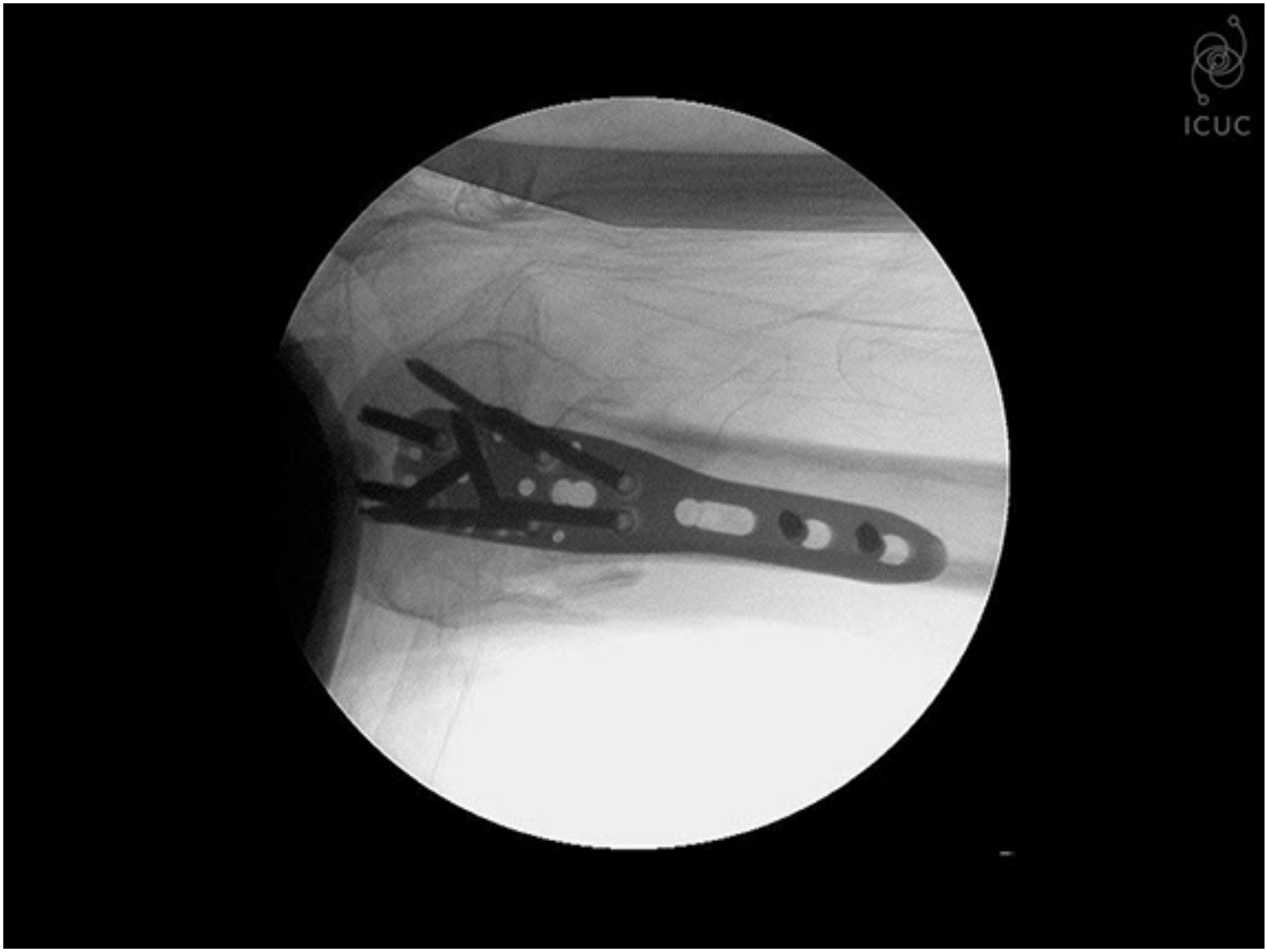
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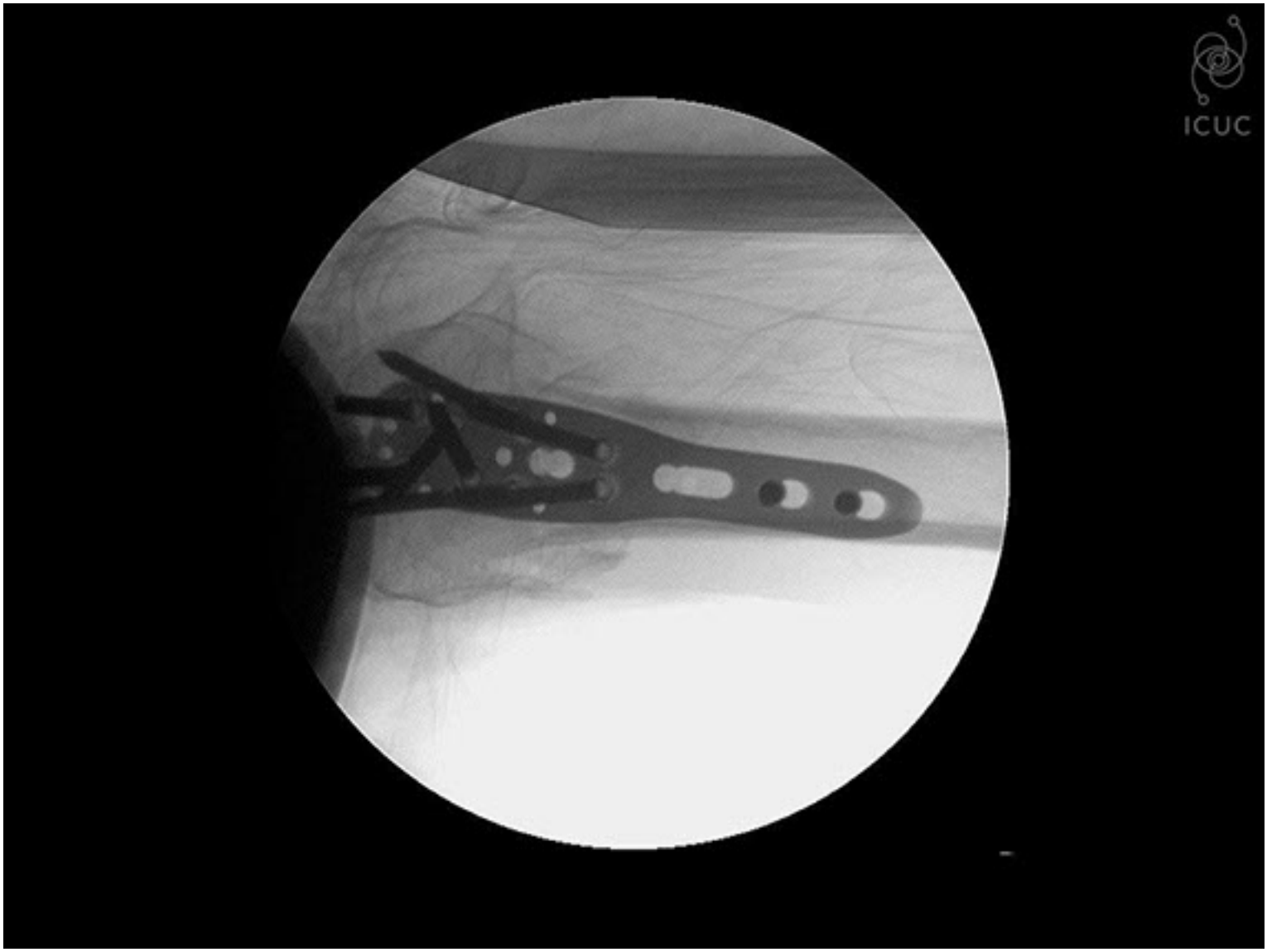
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