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Joint depression in tibial plateau fractures: To bone graft or not to bone graft?

Magdalena Hartwich • Jonathan Lans • Jesse B. Jupiter • Reto Babst • Petro Regazzoni • Alberto Fernandez Dell'Oca

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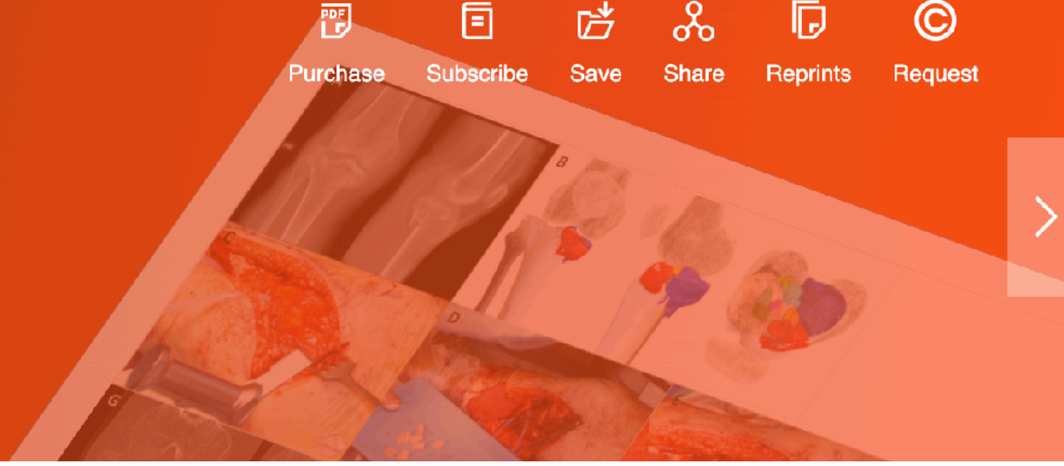

Abstract

Tibial plateau fractures with significant joint depression and metaphyseal comminution pose a challenge. In order to prevent the collapse of the articular surface, some authors propose filling the subchondral void created during reduction with bone graft/substitute, which can add further complications. We present two cases of tibial plateau fractures with severe joint depression of the lateral condyle; both treated with a periarticular rafting construct, in one caseadditional bone substitute was used and in the other case no bone graft/substitute was used; their final outcomes were reported. The treatment of joint depression in tibial plateau fractures using periarticular rafting constructs without bone graft, may be also a valid option, to achieve good final results without the morbidity associated with the use of bone graft/substitutes.

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Joint depression in tibial plateau fractures: To bone graft or not ...

Mar 2, 2023 — The treatment of **joint depression** in **tibial plateau fractures** using periarticular rafting constructs without **bone graft**, may be also a valid ...

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Joint depression in tibial plateau fractures: To bone graft or not to bone graft?

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Affiliations – collapse

Affiliations

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lateral articular surface of
ized **bone graft** and...

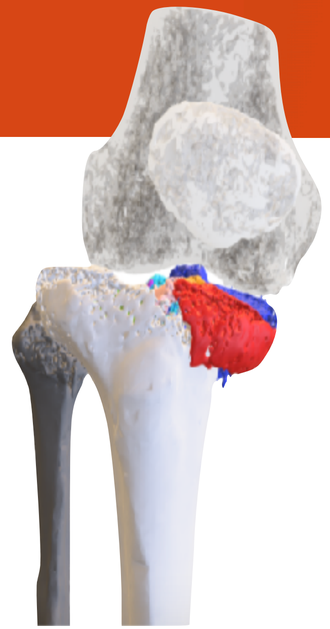
ctures?

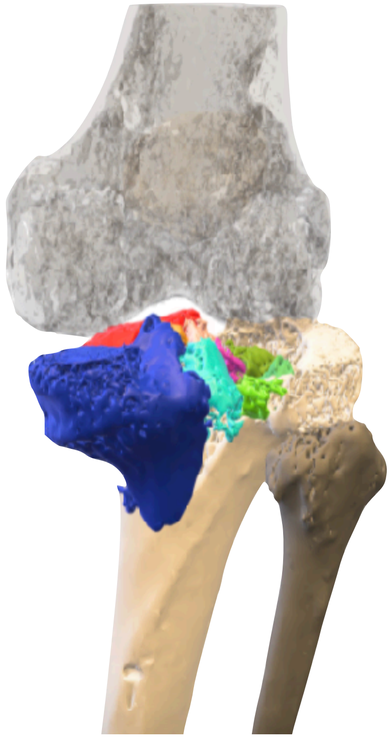
Feedback

Introducción

- **Fracturas de platillo tibial**
  - Fracturas articulares
  - Poco frecuentes
  - Patrones complejos, amplia variabilidad

- **Clasificación:**
  - Lo fundamental es analizar el tipo y ubicación del o los trazos para definir tratamiento
  - Modelo 3D coloreado https://www.icuc.net/case-study/5cd33b6770243d7c9f46e665
  - “Lista de problemas”





Introducción

- **Tratamiento**
  - Complejo, particularmente en presencia de depresión articular asociado a conminución metafisaria.
  - Objetivos
    - Restablecer biomecánica articular
    - Prevenir la artrosis post traumática

Introducción

Casos

- Estudio retrospectivo analítico, usando la base de datos ICUC.
- Se identificaron 39 casos con hundimiento articular (AO/OTA 41 B y C) de un total de 63 fracturas de platillo tibial.
  - Con injerto/sustituto óseo n=12
  - Sin injerto/sustituo óseo n=27

Casos

https://www.icuc.net/expert-opinion/63fe1c6d70243d14aeaa9359

- **39** casos con hundimiento articular:
  - **Con** injerto/sustituto óseo **n=12**
    - Placas unicondilares (n=7)
    - Placas bicondilares (n=3)
    - Placa “rim” (n=1)
    - Placa unicondilar + “rim” (n=1)
  - **Sin** injerto/sustituo óseo **n=27**
    - Placas unicondilares (n=21)
    - Placas bicondilares (n=6)
    - Asociación de estructura “rafter” adicional (kw o tornillos)

“Using the link imbedded in this article, the reader will have the ability to review the entire ICUC data base regarding the described clinical topic"

https://www.icuc.net/expert-opinion/63fe1c6d70243d14aeaa9359

ICUC *score*

Functional Limitation according to patient (FL)

0	**Zero functional limitation.** Can do any activity, as before fracture.
1	**Can do most activities.** Some limitations of joint motion. Slight functional impairment.
2	**Can only do certain activities.** Clear limitation of joint motion. Marked functional impairment.
3	**Unable to do most activities.** Poor range of joint motion.
4	**Unable to do any activity.** Stiff joint.

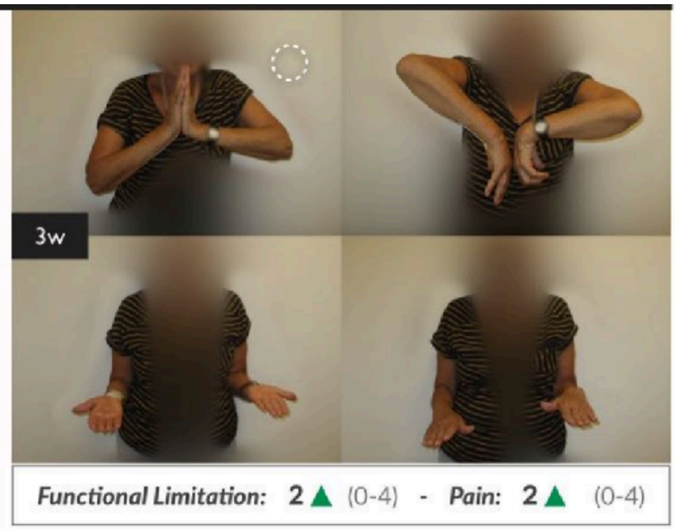
▲ Improving ● Stable ▼ Worsening

Pain (P)

0	1	2	3	4
Zero pain	Mild pain	Moderate pain	Intense pain	Worst possible pain

▲ Improving ● Stable ▼ Worsening

A perfect result is:
Zero limitations and Zero pain



Functional Limitation: 2 ▲ (0-4) - ***Pain:*** 2 ▲ (0-4)

Functional Limitation: 1 ▲ (0-4) - ***Pain:*** 0 (0-4)

Resultados

Table 1
Outcomes.

#	ID	Void Size	Graft YES/NO	Weeks Follow up	ICUC score	Collapse
1	CA-985	Large	YES	89	-	NO
2	CA-538	Very large	YES	104	FL0 P0	NO
3	CA-111	Very large	YES	0	-	-
4	CA-485	Large	YES	0	-	-
5	PA-779	Very large	YES	12	-	NO
6	PA-042	Very large	YES	45	-	NO
7	PA-689	Large	YES	49	-	NO
8	CA-126	Large	YES	11	-	NO
9	PA-447	Large	YES	12	-	NO
10	PA-236	Large	YES	104	FL0 P0	NO
11	PA-294	Large	YES	0	-	-
12	PA-757	Large	YES	0	-	-
13	CA-449	Very large	NO	119	FL1+ P1+	NO
14	CA-679	Large	NO	125	FL1+ P0	NO
15	CA-335	Large	NO	226	FL2= P1=	NO
16	CA-052	Large	NO	100	FL1+ P0	NO
17	PA-754	Large	NO	52	-	NO
18	PA-250	Very large	NO	42	FL1+ P1+	NO
19	PA-433	Large	NO	14	FL1+ P1+	NO
20	PA-613	Very large	NO	204	FL0 P0	NO
21	PA-328	Very large	NO	55	FL0 P0	NO
22	PA-847	Very large	NO	143	FL1= P1=	NO
23	PA-826	Very large	NO	70	FL1+ P1+	NO
24	PA-673	Very large	NO	13	FL1+ P0	NO
25	PA-435	Very large	NO	44	FL2+ P1=	NO
26	PA-212	Large	NO	60	FL0 P0	NO
27	PA-425	Very large	NO	180	FL1+ P1+ (68w)	NO
28	PA-162	Large	NO	66	FL1+ P0	NO
29	PA-113	Very large	NO	65	FL1+ P1+	NO
30	PA-025	Very large	NO	13	FL2+ P1+	NO
31	PA-379	Large	NO	20	FL1+ P0	NO
32	PA-619	Large	NO	17	FL1+ P0	NO
33	PA-256	Large	NO	0	-	-
34	PA-563	Large	NO	38	FL0 P0 (470w)	NO
35	PA-977	Very large	NO	70	FL1+ P1+	NO
36	PA-640	Very large	NO	69	FL3- P3-	YES
37	CA-544	Very large	NO	23	FL2+ P1+	NO
38	CA-154	Large	NO	10	-	NO
39	PA-353	Large	NO	20	FL1+ P0	NO

Seguimiento: 10-226 semanas
Sin seguimiento: 13 casos

Resultados globales: Buenos

Buen resultado (ICUC score 0-1): **21** casos
- Con sustituto óseo (n=2)
- Sin sustituto óseo (n=19)
- RX sin pérdida de reducción ni colapso articular

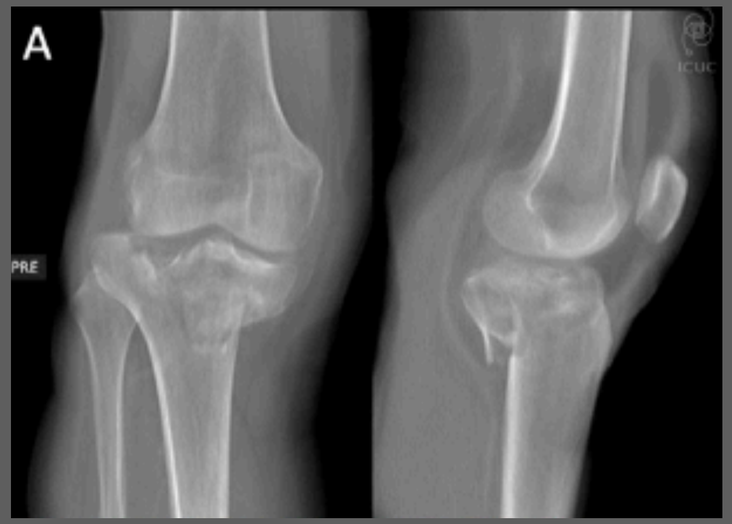
Regular resultado (ICUC score 2): 4 casos
- Todos sin sustituto óseo
- RX sin pérdida de reducción ni colapso articular

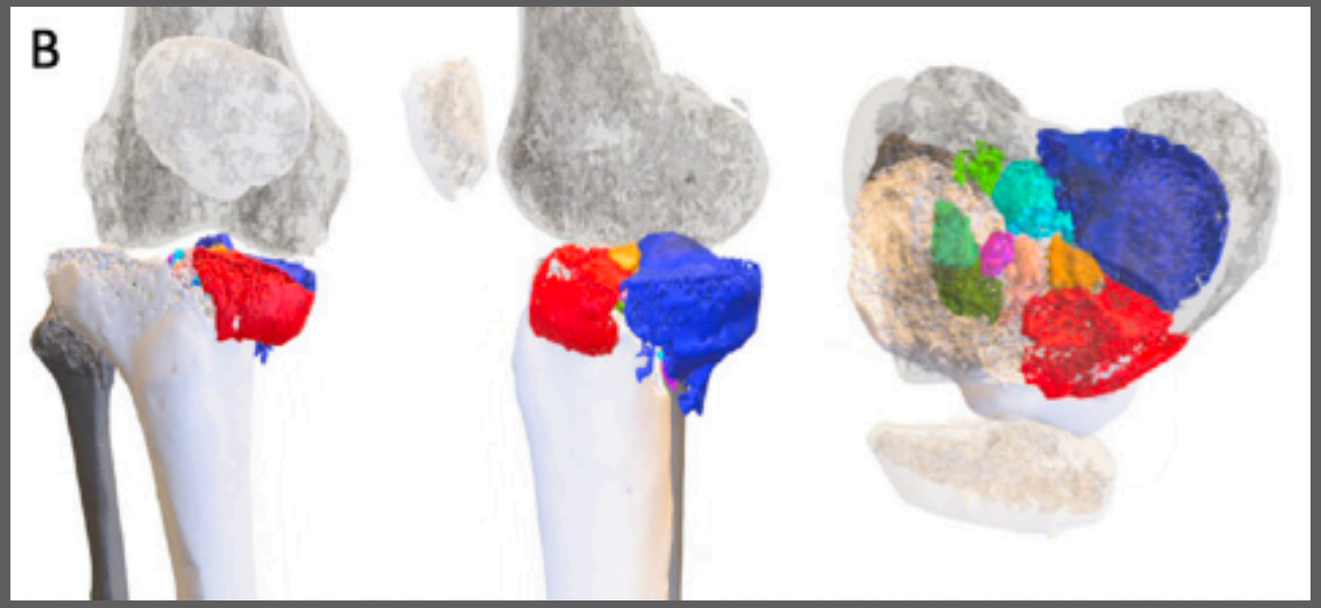
Mal resultado (ICUC score 3): **1** caso (ID: 41-PA-640)
Pérdida de reducción y colapso articular
Sin sustituto óseo

No se reportó infección en ningún caso

Case ID 41-CA-538:

https://www.icuc.net/case-study/5cd33b6770243d7c9f46e665





Sexo femenino. 75 años.
Siniestro de tránsito como conductora de auto.
Politraumatizada.

Balance lesional: Fractura de pilón tibial expuesta, fractura cerrada de platillo tibial en miembro inferior derecho y fractura expuesta de antebrazo derecho. ISS = 32.

A. Radiografía simple preparatoria
B. Modelo 3D coloreado interactivo

Case ID 41-CA-538:

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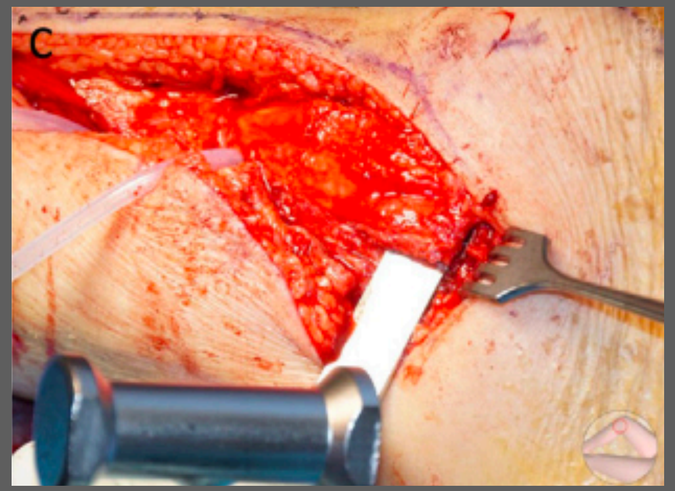
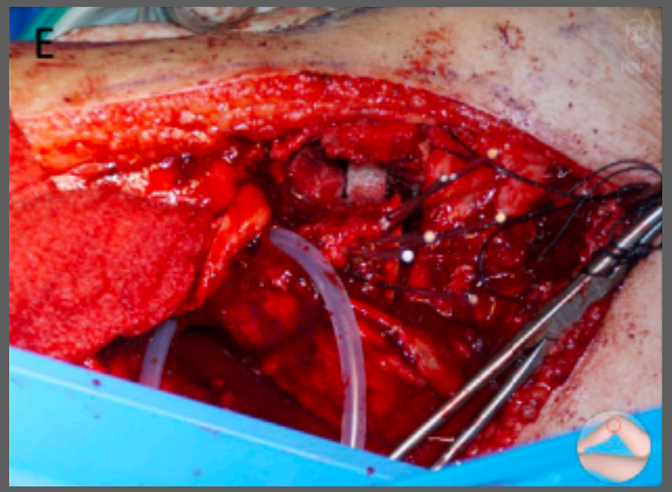
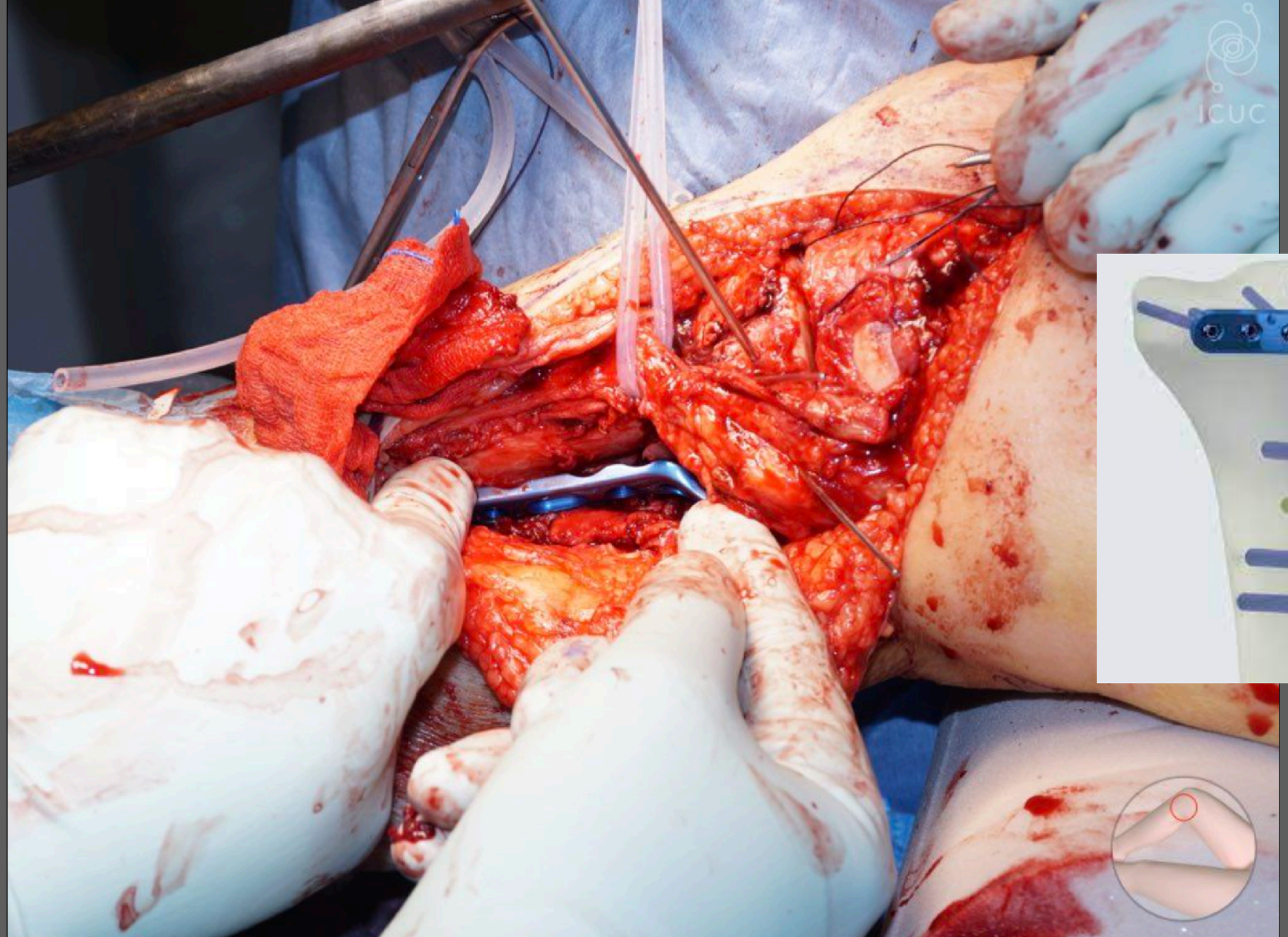




Sexo femenino. 75 años.
Siniestro de tránsito como conductora de auto.
Politraumatizada.

Balance lesional: Fractura de pilón tibial expuesta, fractura cerrada de platillo tibial en miembro inferior derecho y fractura expuesta de antebrazo derecho. ISS = 32.

C, D, E. Imágenes intraoperatorias.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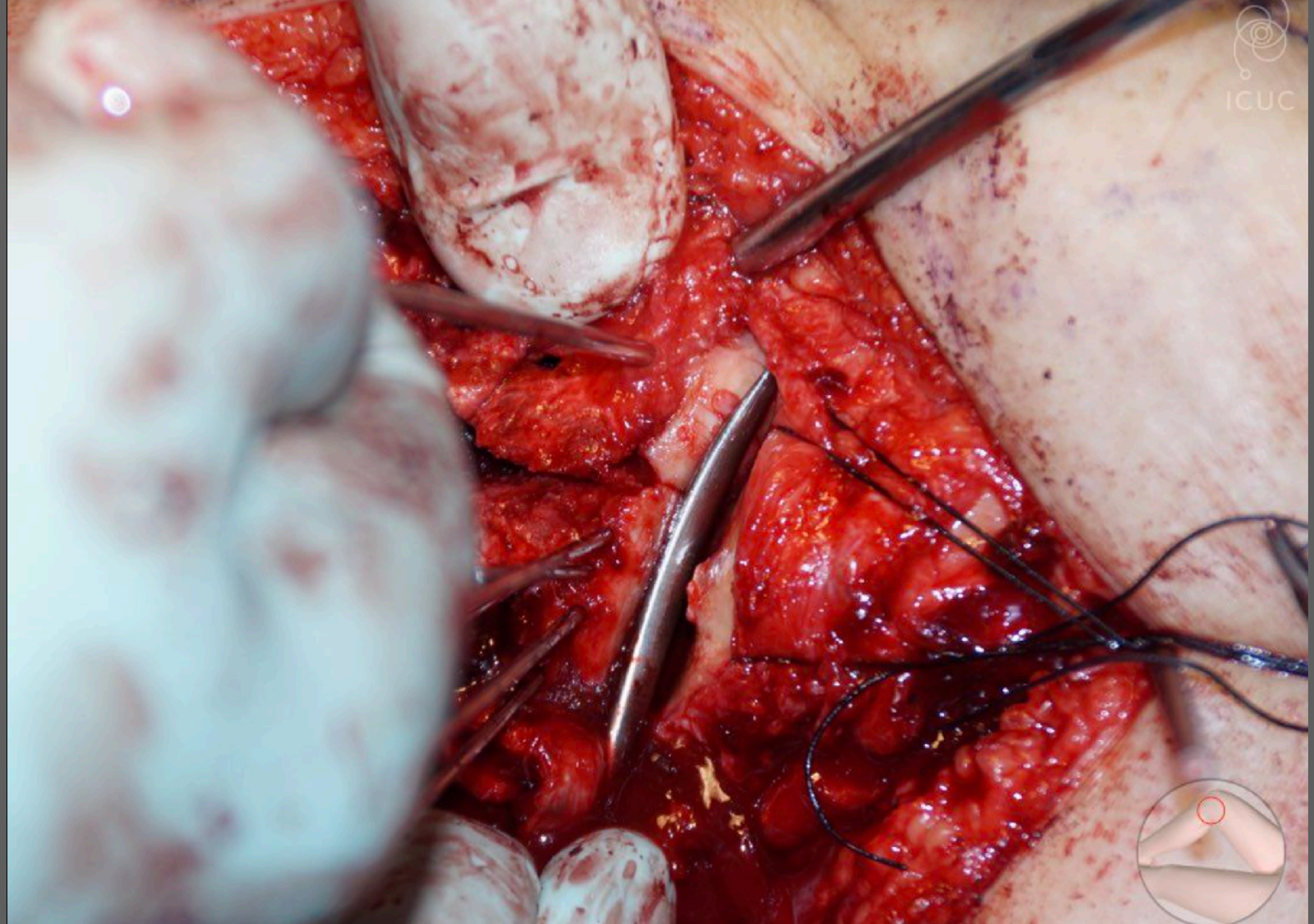
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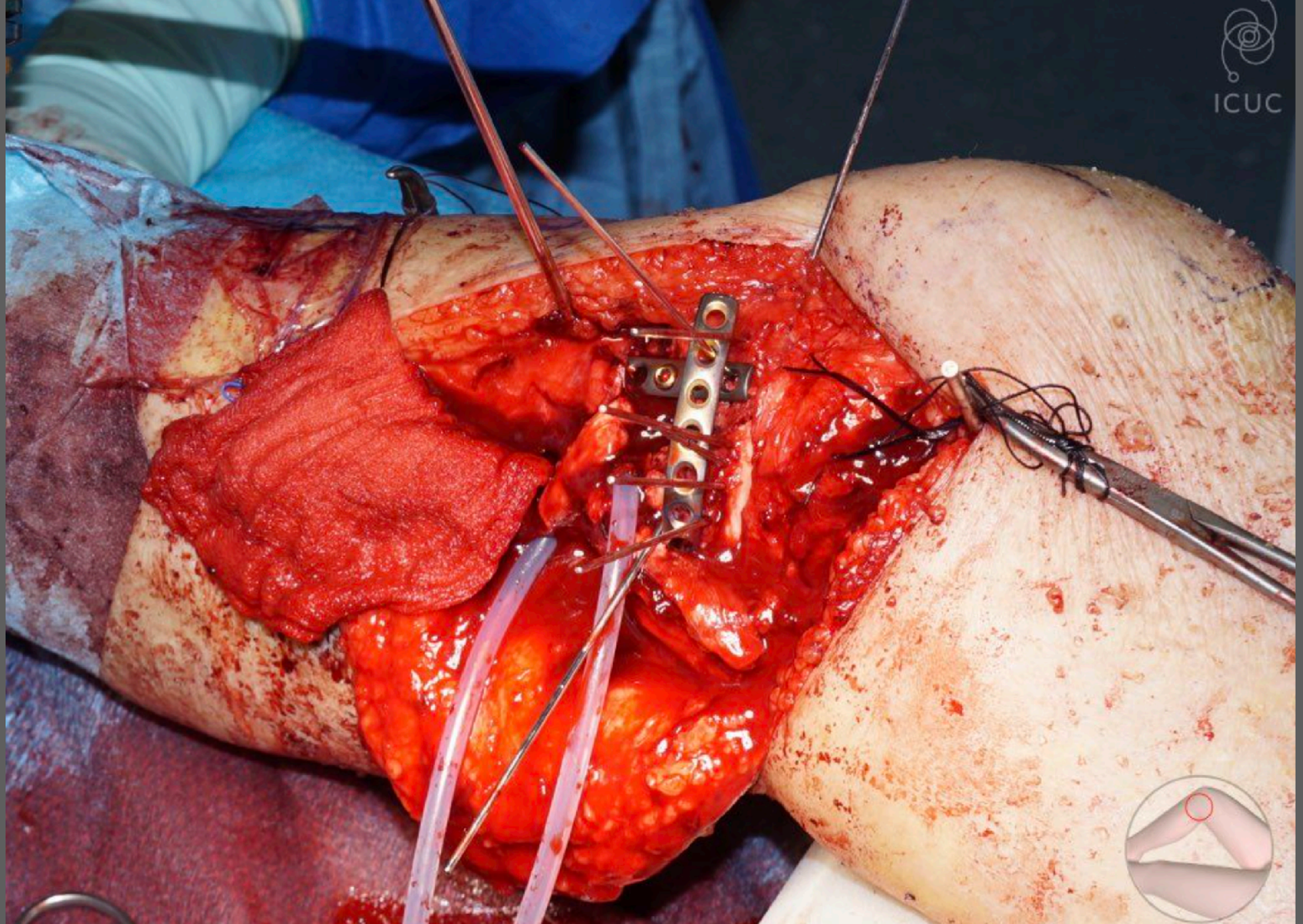
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Case ID 41-CA-538:

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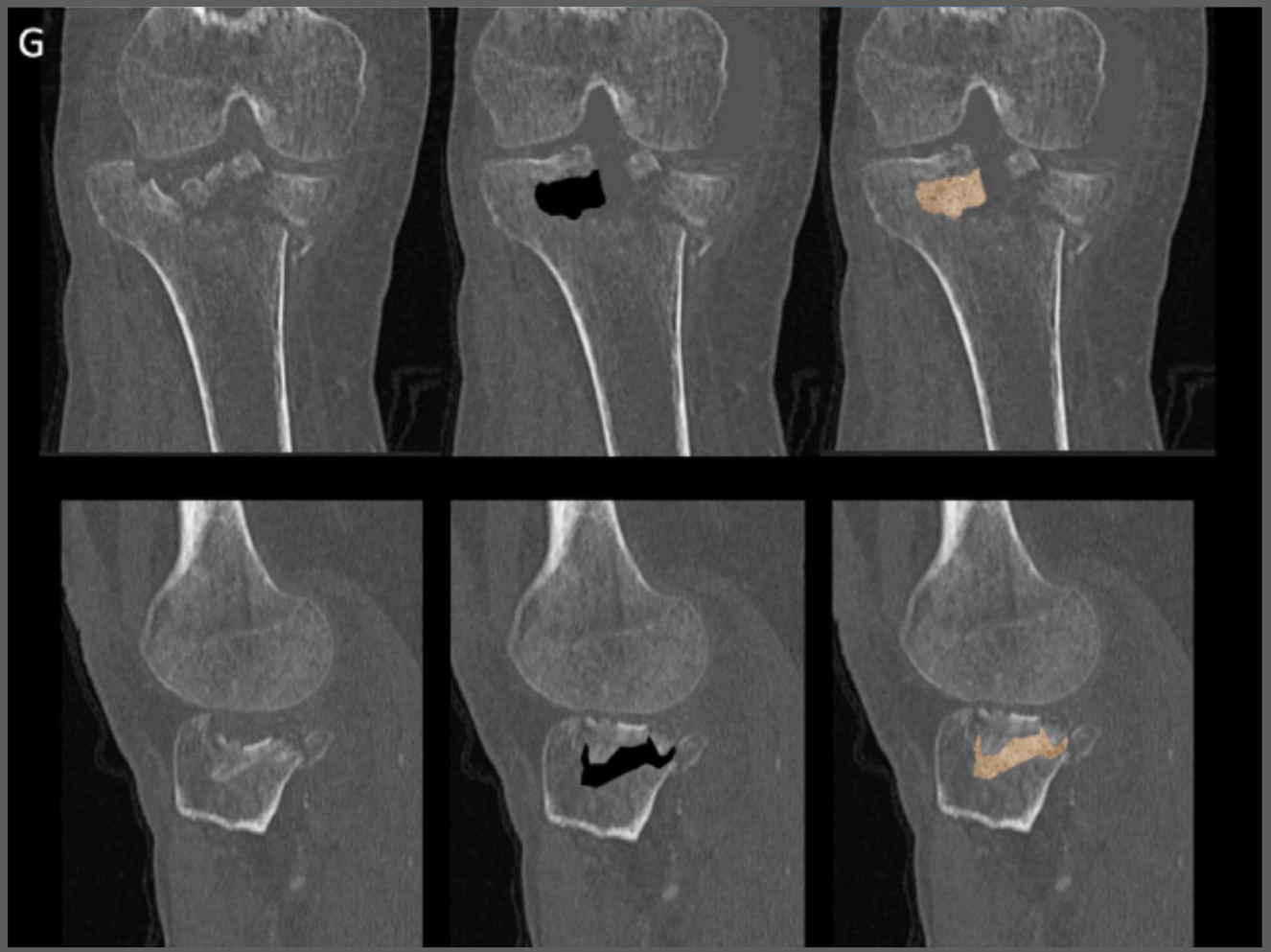


Sexo femenino. 75 años.
Siniestro de tránsito como conductora de auto.
Politraumatizada.

Balance lesional: Fractura de pilón tibial expuesta, fractura cerrada de platillo tibial en miembro inferior derecho y fractura expuesta de antebrazo derecho. ISS = 32.

G. Defecto subcondral post reducción

Case ID 41-CA-538:

https://www.icuc.net/case-study/5cd33b6770243d7c9f46e665

Sexo femenino. 75 años.
Siniestro de tránsito como conductora de auto.
Politraumatizada.

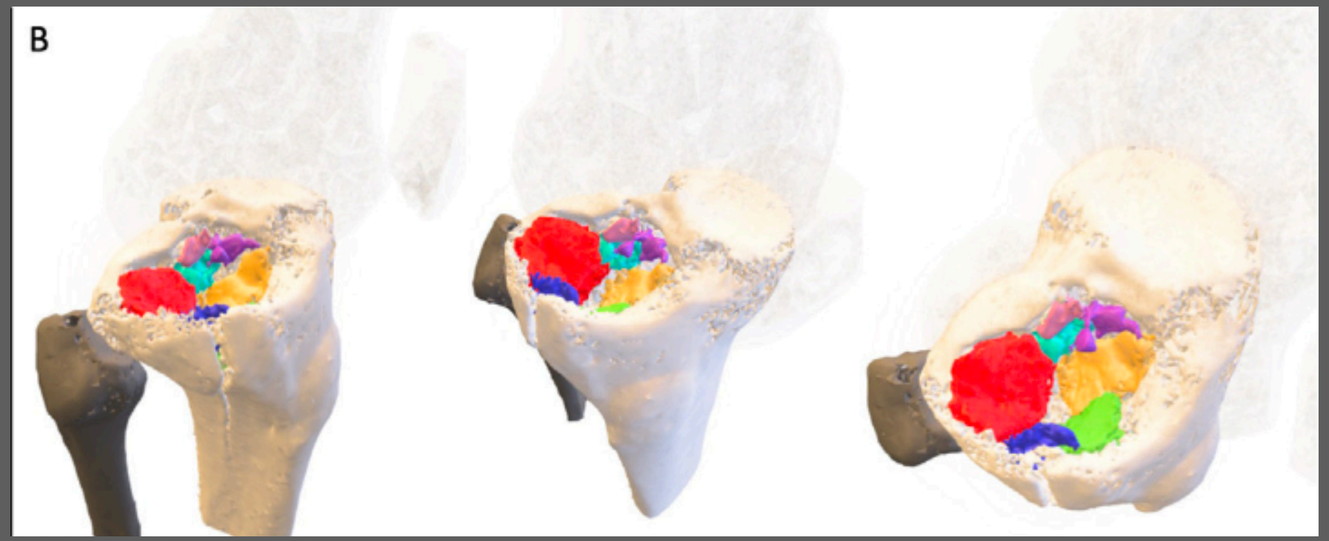
Balance lesional: Fractura de pilón tibial expuesta, fractura cerrada de platillo tibial en miembro inferior derecho y fractura expuesta de antebrazo derecho. ISS = 32.

H. Radiografía de control a las 29 semanas.

ICUC score telefónico a las **104 semanas FL 0 D0.**

Case ID 41-CA-977:

https://www.icuc.net/case-study/60789b0b70243d46a5afbb3d



Sexo masculino. 55 años.
Fractura cerrada de platillo tibial miembro inferior derecho.

Lesión aislada.

A. Radiografía simple preparatoria
B. Modelo 3D coloreado interactivo

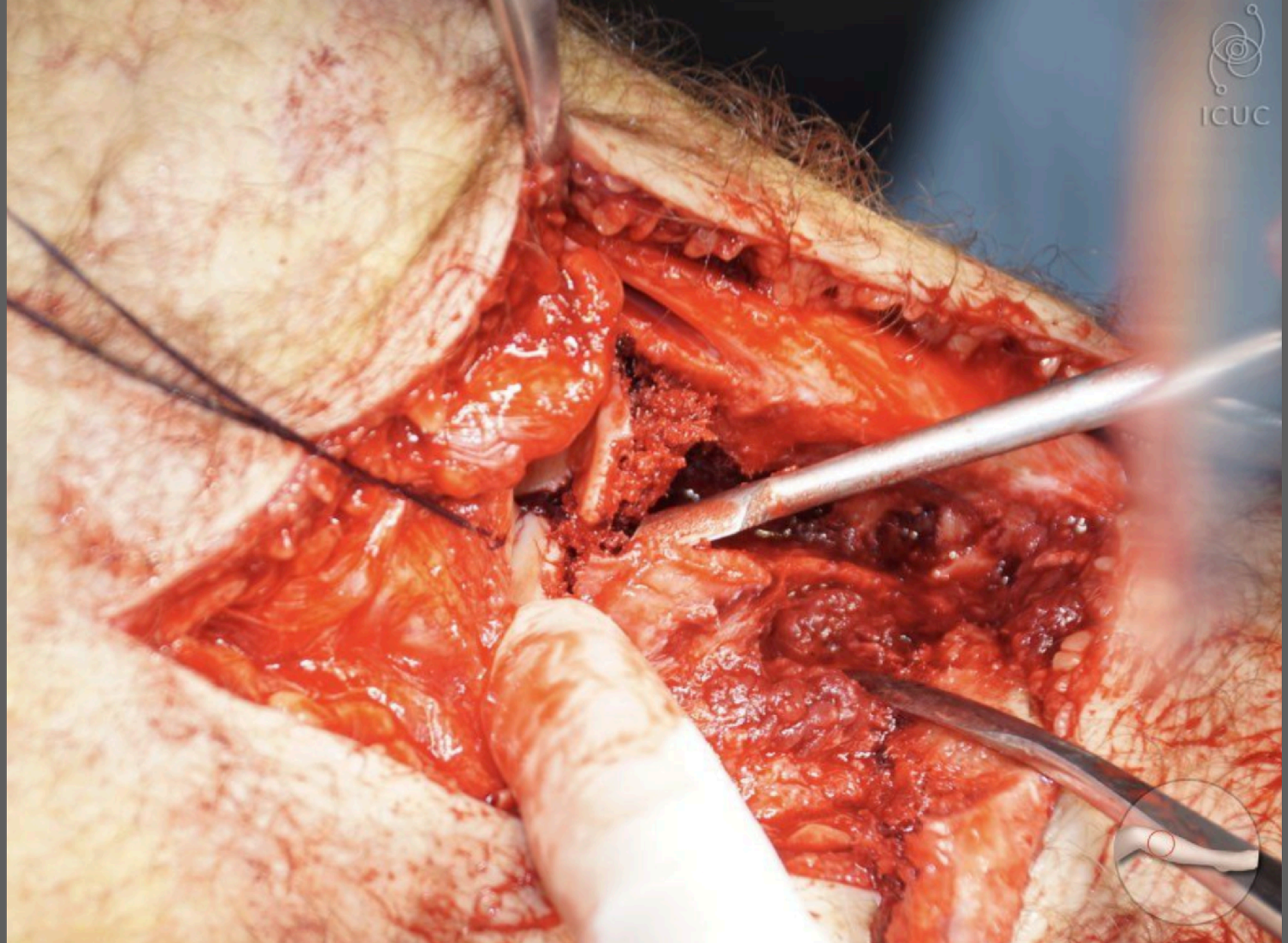
Case ID 41-CA-977:

https://www.icuc.net/case-study/60789b0b70243d46a5afbb3d

Sexo masculino. 55 años.
Fractura cerrada de platillo tibial miembro inferior derecho.

Lesión aislada.

Imágenes intraoperatorias.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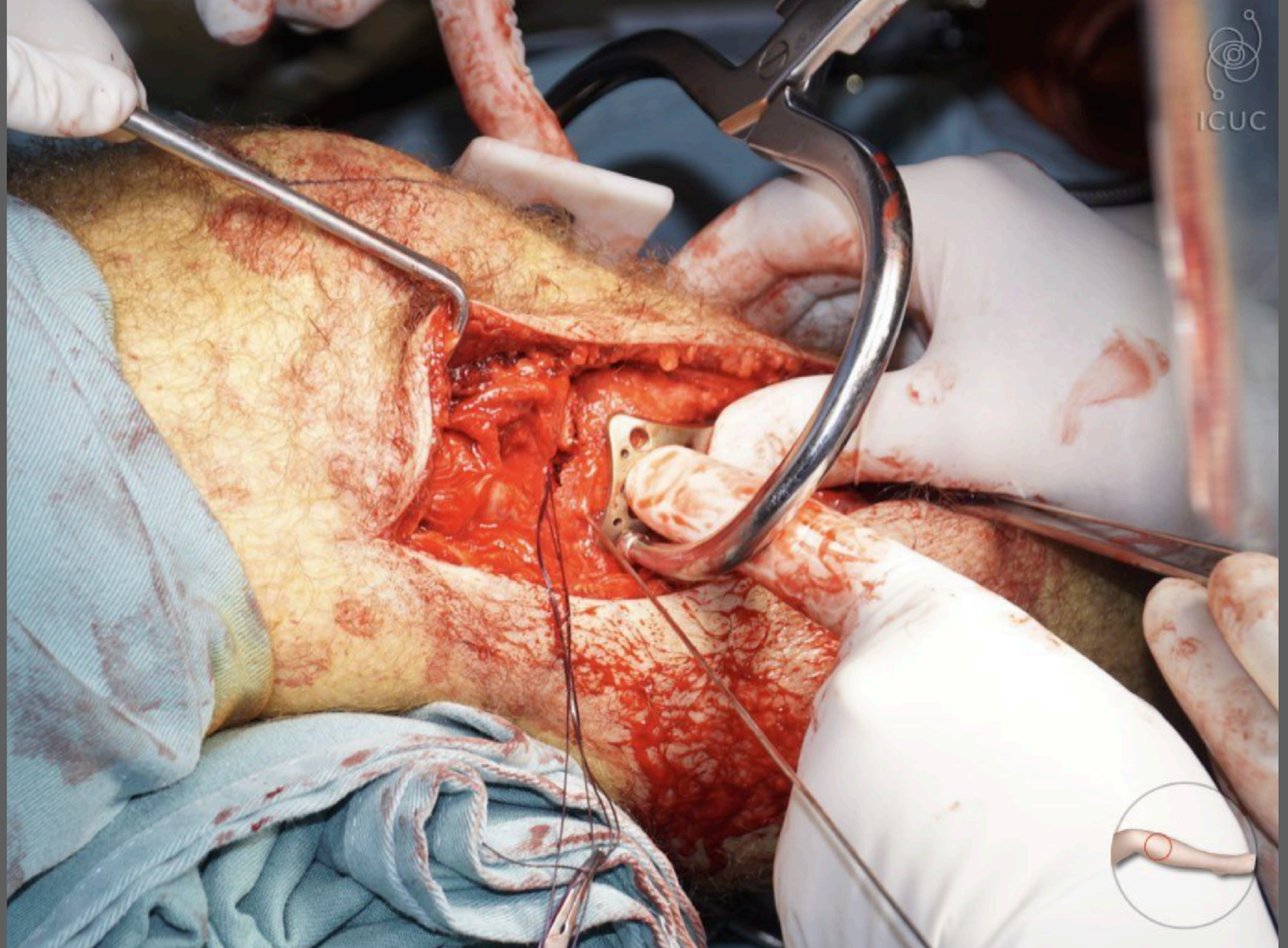

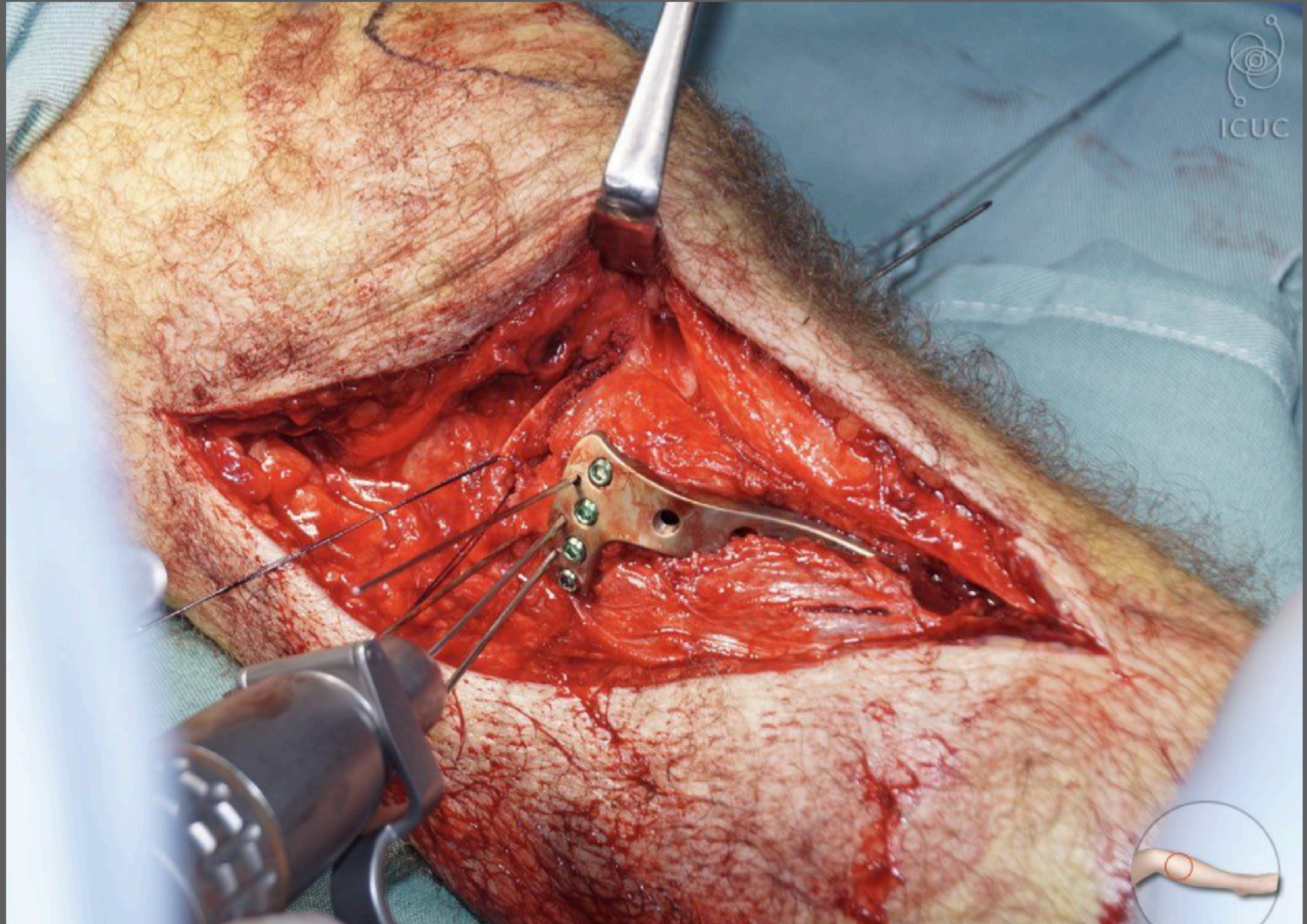
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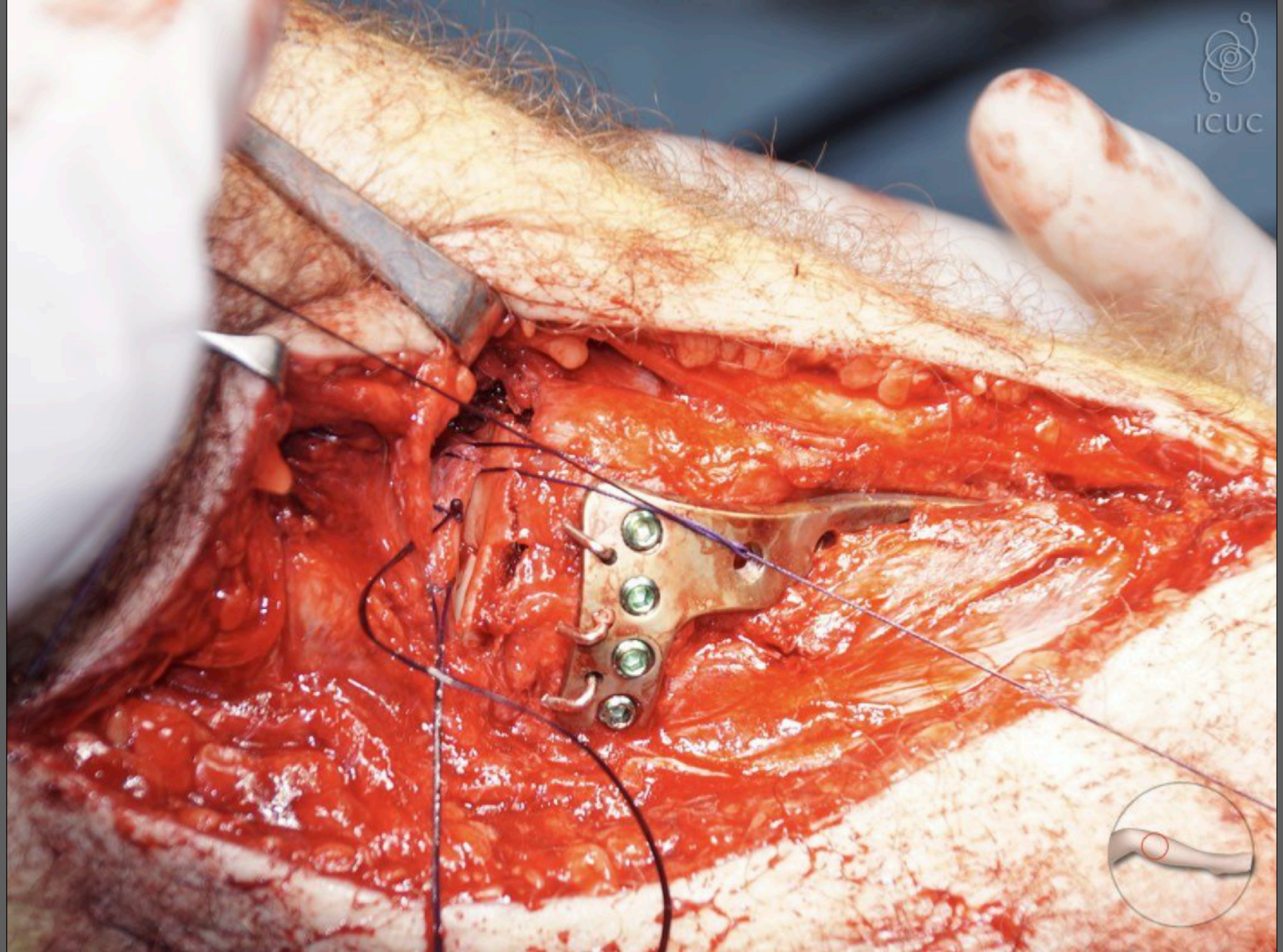
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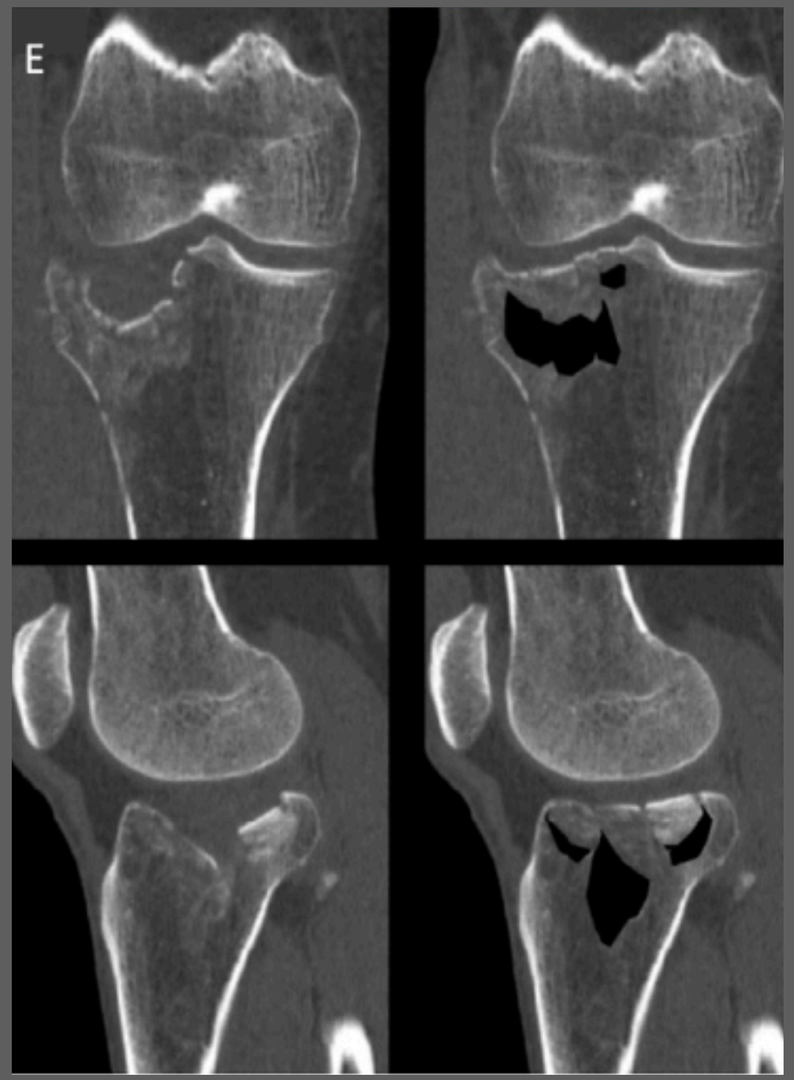

Sexo masculino. 55 años.
Fractura cerrada de platillo tibial miembro inferior derecho.

Lesión aislada.

E. Defecto subcondral post reducción

Case ID 41-CA-977:

https://www.icuc.net/case-study/60789b0b70243d46a5afbb3d

Sexo masculino. 55 años.
Fractura cerrada de platillo tibial miembro inferior derecho.

Lesión aislada.

F. Radiografía de control a las 70 semanas.

Case ID 41-CA-977:

https://www.icuc.net/case-study/60789b0b70243d46a5afbb3d

Sexo masculino. 55 años.
Fractura cerrada de platillo tibial miembro inferior derecho.

Lesión aislada.

ICUC score a las **70** semanas: **FL1 = D1+.**


70w
ICUC

Consideraciones finales

- Aunque se recomienda el uso de injerto óseo o sustituto, la fijación interna utilizando un montaje “rafter” periarticular sin injerto óseo o sustituto óseo para fracturas de meseta tibial proximal con hundimiento también puede lograr buenos resultados.

I think here with the proximal tibia we don’t need to worry about too much.
We have a basic question as a good research approach “Does bone graft make a difference?” And we don’t have the answer, but we have enough data to show that it may or may not help.

J. Jupiter, July, 2022.


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