Hospital Base Valdivia

Salud y Vida desde 1939

Universidad Austral de Chile

Conocimiento y Naturaleza

OSTEOSARCOMA: segunda parte

IV Jornada Educación Médica Continua Año 2019

sáb., 23 nov. | Hospital San Borja Arriarán

UME

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Universidad Austral de Chile

Objetivos

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- Contexto histórico
- Definiciones
- Epidemiología y Clínica
- Imagenología
- Patogenia
- Clasificación: tipos y grado
- Anatomía patológica tradicional (casos del Comité de Tumores H Base Valdivia)
- Estudios especiales
- Tratamientos de vanguardia

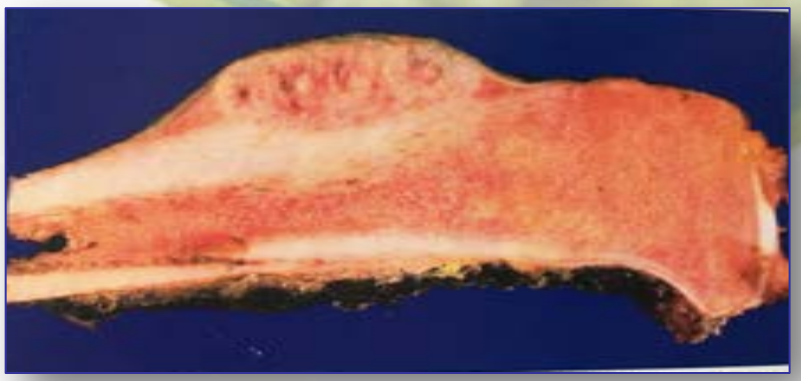
Osteosarcoma periostal

- Neoplasia maligna de grado intermedio que se origina en la superficie ósea (OS condroblástico yuxtacortical)
- <2% de los OS
- Sin predilección de sexo
- Peak en 2ª a 3ª década
- Huesos largos caras anterior, lateral o medial
- Dolor y tumefacción
- Rx: masa mineralizada densa adherida al periostio con imágenes en rayos de sol, hueso cortical engrosado y triángulo de Codman

Osteosarcoma periostal

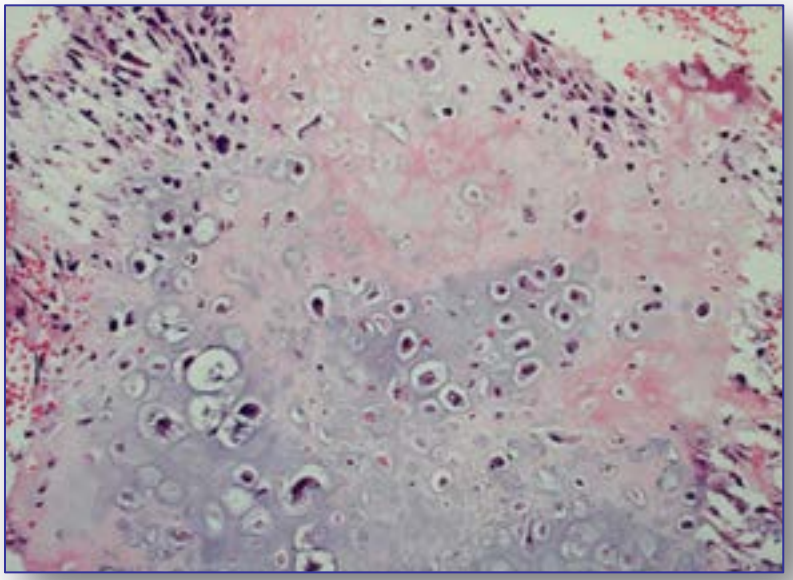
Macro:

- Masa lobulada superficial que envuelve el hueso
- Azulino grisáceo al corte por presencia de cartílago



Micro:

- Variada cantidad de componente condroblástico
- Células redondeadas (cartilagíneas) o fusadas
- Alta actividad mitótica



Osteosarcoma periostal

Dg diferencial:

- Condrosarcoma periostal
- OS parostal
- Osteocondroma
- OS de superficie de alto grado con diferenciación condroblástica

Tratamiento:

* convencional

Vergara M, Chapter G: Bone Forming Lesions, in Bone and Soft Tissue Pathology, pg 111, Elsevier Saunders, 2012

Rosenberg AE, Chapter 16: Osteogenic tumors, in WHO Classification of Tumors Soft Tissue and Bone, pg 275, WHO PRESS, 2013

Clasificación

Malignant	
Low-grade central osteosarcoma	9187/3
Conventional osteosarcoma	9180/3
Chondroblastic osteosarcoma	9181/3
Fibroblastic osteosarcoma	9182/3
Osteoblastic osteosarcoma	9180/3
Secondary osteosarcoma	9184/3
Telangiectatic osteosarcoma	9183/3
Small cell osteosarcoma	9185/3
Parosteal osteosarcoma	9192/3
Periosteal osteosarcoma	9193/3
High-grade surface osteosarcoma	9194/3

Rosenberg AE, Chapter 16: Osteogenic tumors, in WHO Classification of Tumors Soft Tissue and Bone, pg 275, WHO PRESS, 2013

Osteosarcoma de alto grado de superficie

- Neoplasia maligna de alto grado que se origina en la superficie ósea (OS yuxtacortical)
- <1% de los OS
- Predilección de sexo masculino 1,5:1
- Peak en 2ª década
- Huesos largos: fémur distal, húmero y tibia
- Dolor y masa firme
- Rx: masa de la superficie con extensión a partes blandas. Agresivo y destructivo. Skip metastasis

Osteosarcoma de alto grado de superficie

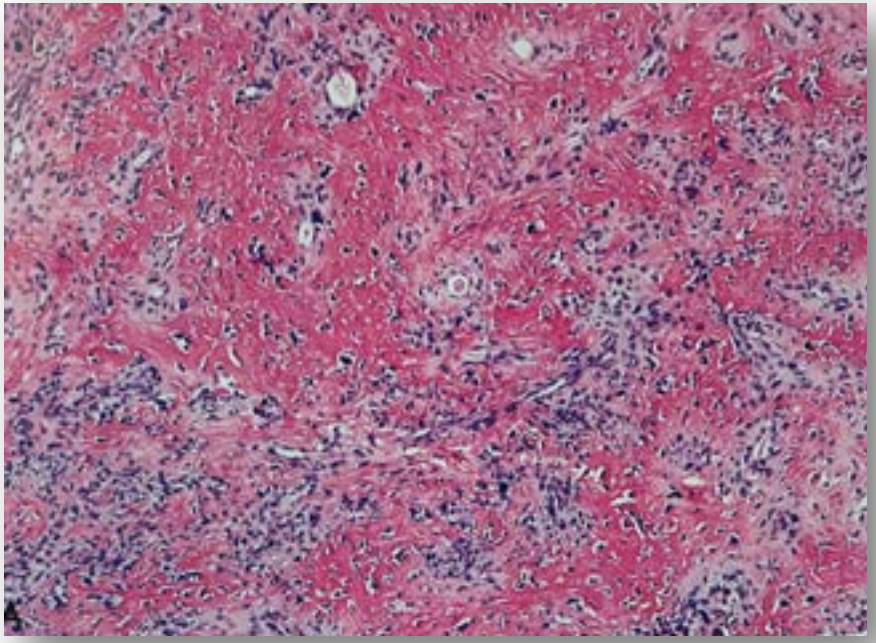
Macro:

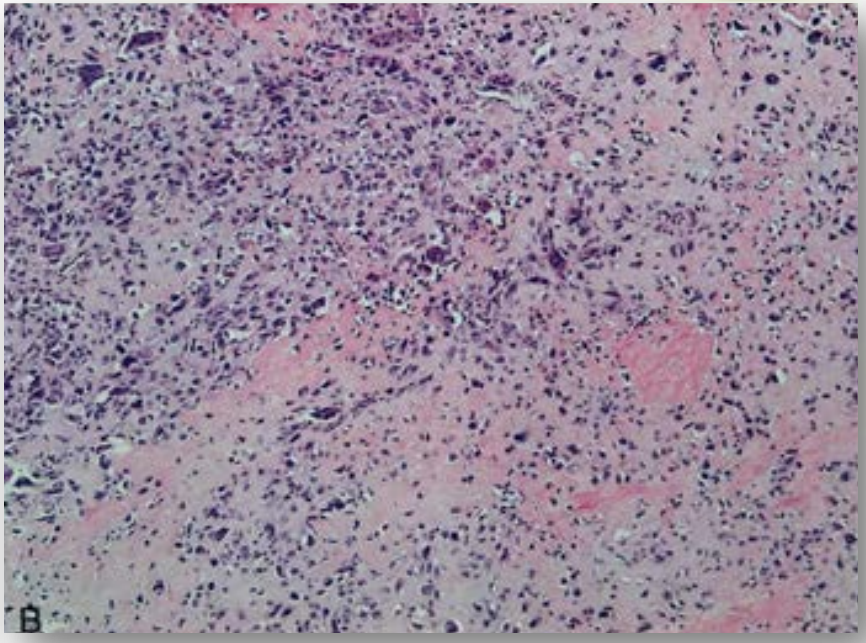
- Masa lobulada superficial que infiltra el hueso cortical
- Multilobulado, hemorragia y necrosis es la regla
- Superficie de corte firme a granular

Micro:

- Variada cantidad de matriz osteoide
- Marcada atipia celular, elevada actividad mitótica

Osteosarcoma de alto grado de superficie





Osteosarcoma de alto grado de superficie

Dg diferencial:

- OS convencional
- OS Paraostal
- OS periostal

Tratamiento:

* Tto convencional

* Mayor factor pronóstico es la respuesta a la quimoterapia neoadyuvante

Vergara M, Chapter G: Bone Forming Lesions, in Bone and Soft Tissue Pathology, pg 111, Elsevier Saunders, 2012

Rosenberg AE, Chapter 16: Osteogenic tumors, in WHO Classification of Tumors Soft Tissue and Bone, pg 275, WHO PRESS, 2013

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¿Qué otras técnicas existen?

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INMUNOHISTOQUÍMICA

- SATB2 (factor transcripción nuclear) tiñe osteoblastos
- Algunos casos CK y EMA (+)
- Cartílago S-100 (+)
- Confrecuencia CD99 (+)

CITOGENÉTICA

* Aberraciones clonales cromosómicas

* Varias traslocaciones no específicas

* TP53 (17p13.1), RB1 (13q14.2) y CHEK2 (22q12.1) mutados, entre otros

Bishop et al. | *Curr Opin Pediatr*. Author manuscript; available in PMC 2017 February 01.

Nielsen GP and Rosenberg AE. Sección 2: Tumores Malignos formadores de Hueso, en Diagnóstico Patológico Hueso, pg 31,AMOLCA, 2018

¿Qué otras opciones terapéuticas existen?

ANTIANGIGÉNICOS

- Terapias target
- OS metastásico o inoperable
- QT de segunda línea
- Estudios en fase II

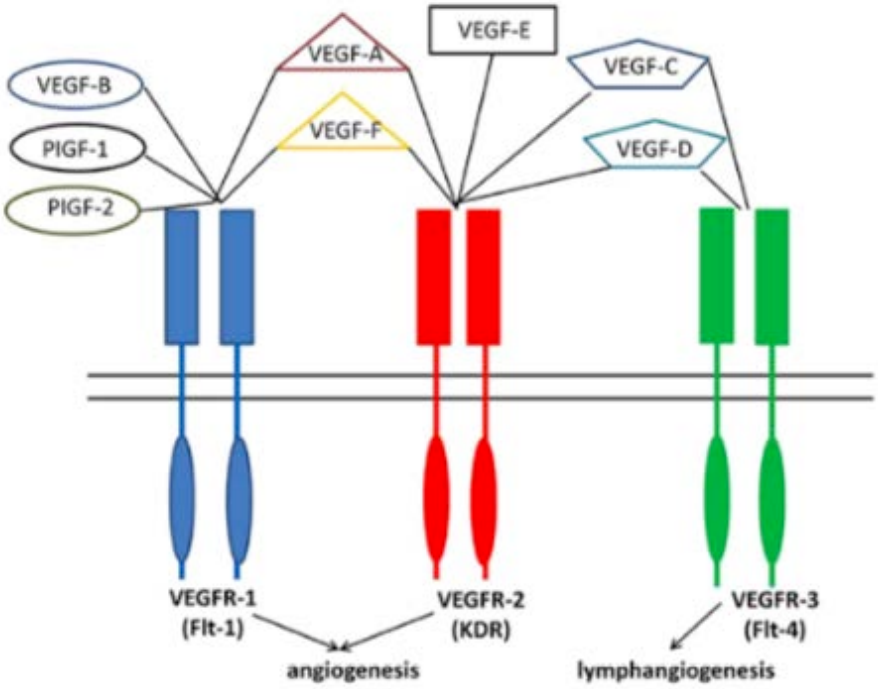

Figure 1. Common subtypes of VEGF and VEGFR and their main function.

ONCOLOGY REPORTS 38: 625-636, 2017

Anti-angiogenesis target therapy for advanced osteosarcoma (Review)

LU XIE, TAO JI and WEI GUO

Musculoskeletal Tumor Center, Peking University People's Hospital, Beijing 100044, P.R. China

Table II. Clinical results of phase I trial with currently available anti-angiogenesis therapy on osteosarcoma.

Drug	Targets	Combined with chemotherapy	The first author's surname	Year of publication	Trial sponsor	Clinical results	Refs.
Gefitinib	EGFR	No	Daw	2005	COG	6/6 PD	(44)
Everolimus; Figitumumab	mTOR; IGF-IR	No	Quek	2010	Novartis and Pfizer	3/3 SD	(87)
Cediranib	VEGFR1-3	No	Fox	2010	NIH, NCI	1/4 PR	(42)
R1507	IGF-IR	No	Bagatell	2010	NIH	2/3 SD	(46)
Sunitinib	VEGFR; PDGFR; c-kit; Flt3, CSF-1 receptor, and RET	No	Dubios	2011	COG	1/2 SD	(43)
Cixutumumab	IGF-IR	No	Malempati	2012	COG	3/3 PD	(36)
Pazopanib	VEGFR1-3; PDGFR	No	Bender	2013	COG	1/4 SD	(39)
Sorafenib; Bevacizumab	VEGFR-2, Raf-1, B-Raf, c-kit, FGFR-1, FLT-3; VEGF-A	Low-dose cyclophosphamide	Navid	2013	Novartis and Pfizer	2/2 SD	(35)

Clinical responses were defined as described in the referred studies. CBR, clinical benefit response; CR, complete response; PR, partial response; MR, minor response; SD, stable disease (for at least 8 weeks); PD, progressive disease (no response). COG, Children's Oncology Group; NIH, National Institutes of Health; NCI, National Cancer Institute; EGFR, epidermal growth factor receptor; mTOR, mammalian target of rapamycin signaling pathways; IGF-IR, type 1 insulin-like growth factor receptor; VEGFR, vascular endothelial growth factor receptor.

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Technical Report

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Yonsei Medical Journal
YMJ
pISSN: 0513-5796 · eISSN: 1976-2437

Sacral Reconstruction with a 3D-Printed Implant after Hemisacrectomy in a Patient with Sacral Osteosarcoma: 1-Year Follow-Up Result

Doyoung Kim[1], Jun-Young Lim[2,3], Kyu-Won Shim[4], Jung Woo Han[5], Seong Yi[1], Do Heum Yoon[1], Keung Nyun Kim[1], Yoon Ha[1], Gyu Yeul Ji[6], and Dong Ah Shin[1]

Pelvic reconstruction after sacral resection is challenging in terms of anatomical complexity, excessive loadbearing, and wide defects. Nevertheless, the technological development of 3D-printed implants enables us to overcome these difficulties. Here, we present a case of sacral osteosarcoma surgically treated with hemisacrectomy and sacral reconstruction using a 3D-printed implant. The implant was printed as a customized titanium prosthesis from a 3D real-sized reconstruction of a patient's CT images. It consisted mostly of a porous mesh and incorporated a dense strut. After 3-months of neoadjuvant chemotherapy, the patient underwent hemisacretomy with preservation of contralateral sacral nerves. The implant was anatomically installed on the defect and fixed with a screw-rod system up to the level of L3. Postoperative pain was significantly low and the patient recovered sufficiently to walk as early as 2 weeks postoperatively. The patient showed left-side foot drop only, without loss of sphincter function. In 1-year follow-up CT, excellent bony fusion was noticed. To our knowledge, this is the first report of a case of hemisacral reconstruction using a custom-made 3D-printed implant. We believe that this technique can be applied to spinal reconstructions after a partial or complete spondylectomy in a wide variety of spinal diseases.

Key Words: 3D-printing, sacrum, instrumentation, spinal fusion

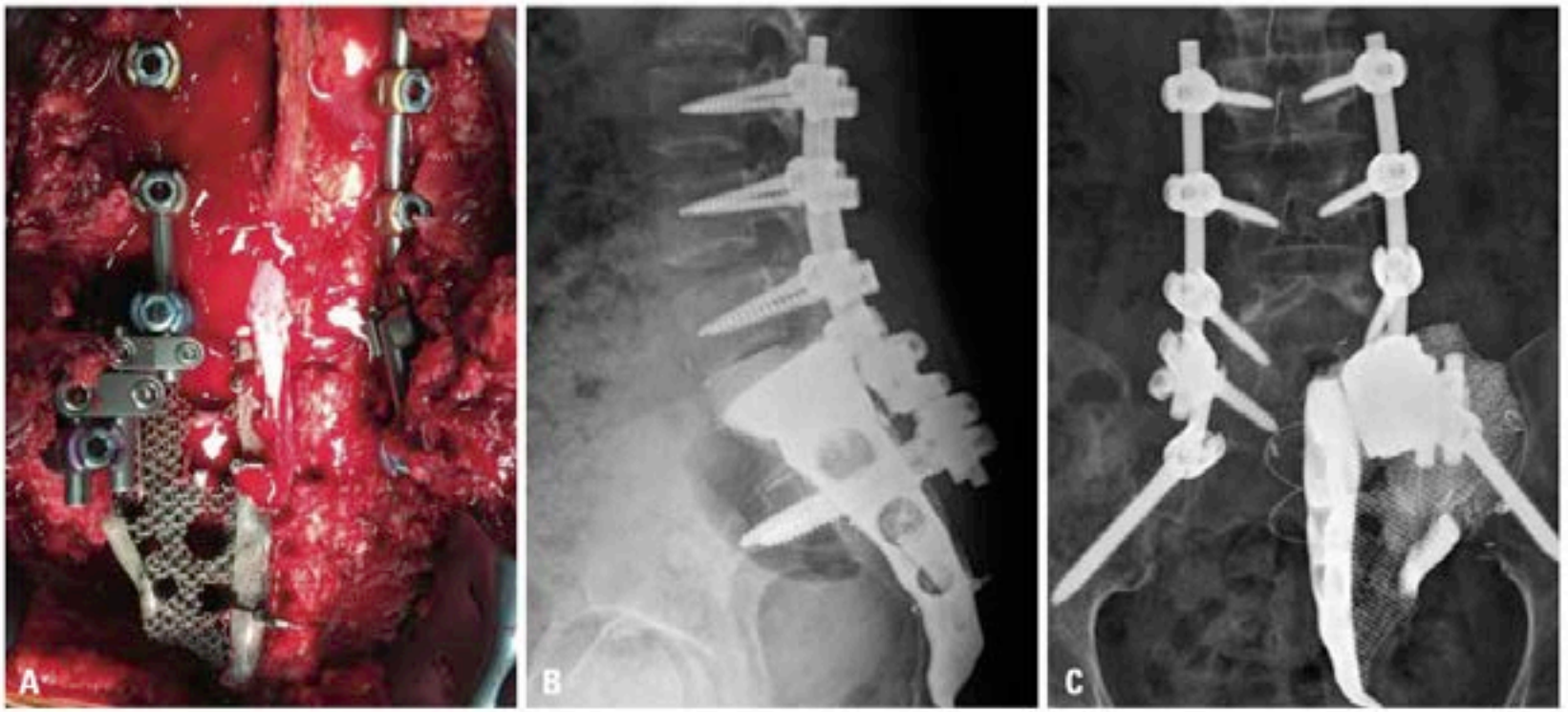

Fig. 4. (A) Rigid reconstruction achieved with the 3D implant and screw-rod system. (B) Lateral X-ray at postoperative 1 week demonstrates a complete lumbosacral construct. (C) AP X-ray at postoperative 1 week demonstrates a complete lumbosacral construct. AP, anterior-posterior.

SCIENTIFIC REPORTS

OPEN

3D printed personalized titanium plates improve clinical outcome in microwave ablation of bone tumors around the knee

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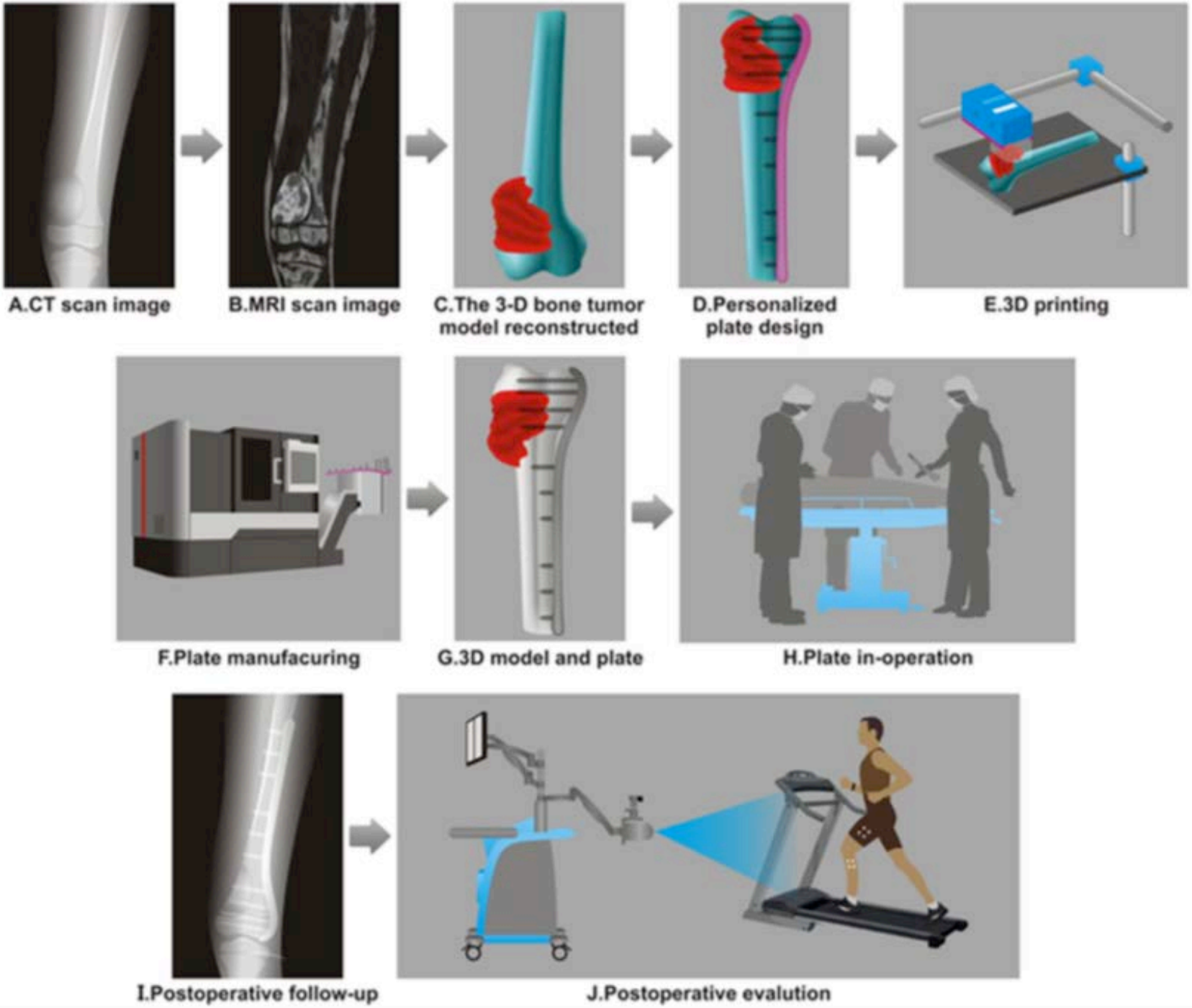
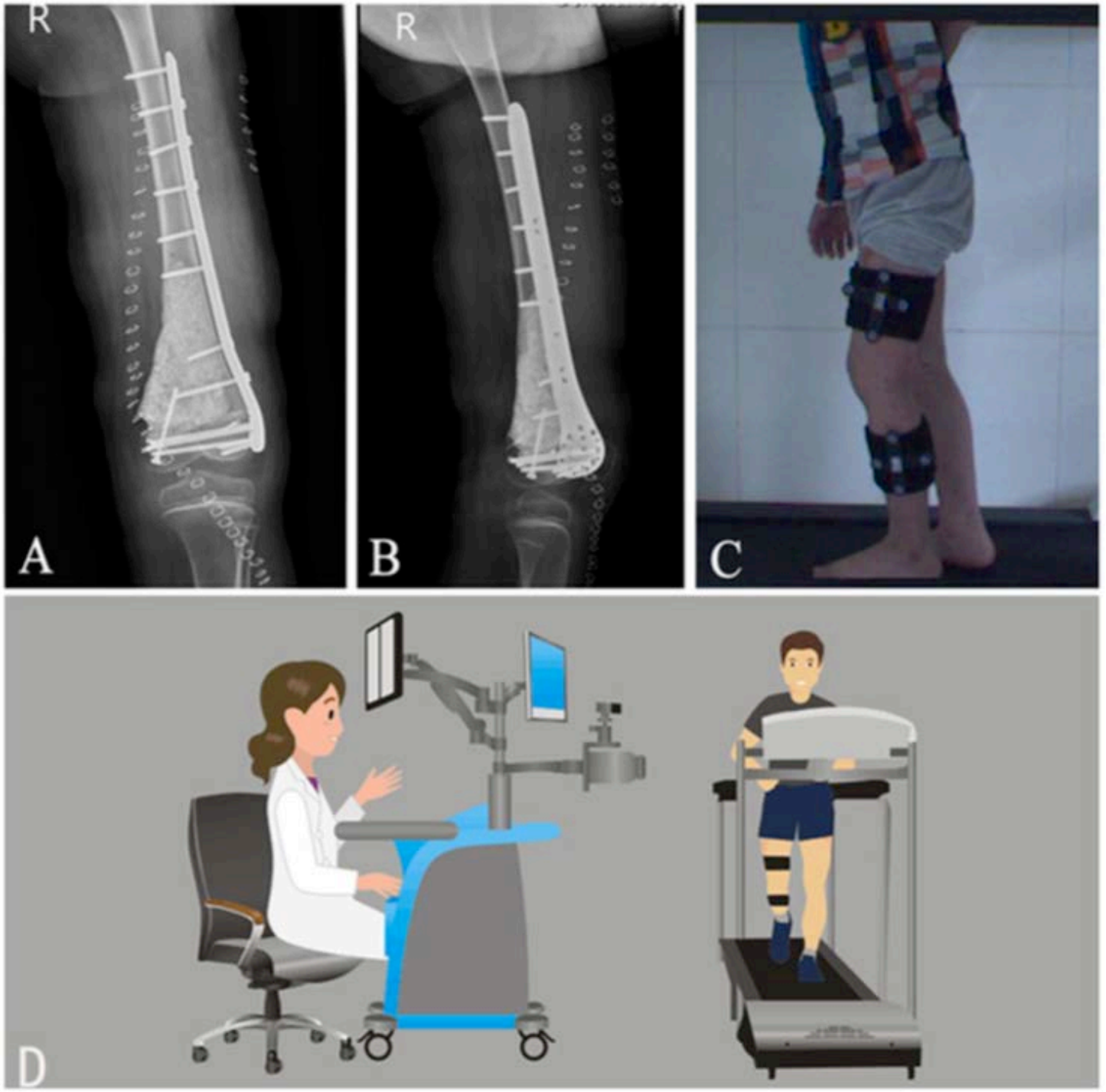
Published online: 08 August 2017

Limin Ma[1], Ye Zhou[1], Ye Zhu[2], Zefeng Lin[1], Lingling Chen[1], Yu Zhang[1], Hong Xia[1] & Chuanbin Mao[2,3]

Patient	Age	Sex	Diagnosis	Chemotherapy	Follow-up (month)/Status
1	23	Male	Giant cell tumor of the right distal femur	N	27/Alive
2	18	Male	Ewing's sarcoma of the right distal femur	Y	25/Alive
3	8	Male	Osteosarcoma of the left distal femur	Y	16/Alive
4	17	Male	Osteosarcoma of the right distal femur	Y	23/Alive
5	54	Male	Giant cell tumor of the left distal femur	N	29/Alive
6	29	Female	Giant cell tumor of the left proximal tibia	N	33/Alive
7	18	Male	Osteosarcoma of the right proximal tibia	Y	34/Alive
8	15	Male	Osteosarcoma of the right proximal tibia	Y	Died of lung metastases after 14 months
9	26	Male	Chondrosarcoma of the left distal femur	Y	33/Alive
10	19	Male	Osteosarcoma of the left distal femur	Y	36/Alive
11	23	Male	Osteosarcoma of the right proximal tibia	Y	42/Alive
12	24	Female	Osteosarcoma of the right distal femur	Y	40/Alive


A.CT scan image
B.MRI scan image
C.The 3-D bone tumor model reconstructed
D.Personalized plate design
E.3D printing
F.Plate manufacuring
G.3D model and plate
H.Plate in-operation
I.Postoperative follow-up
J.Postoperative evalution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