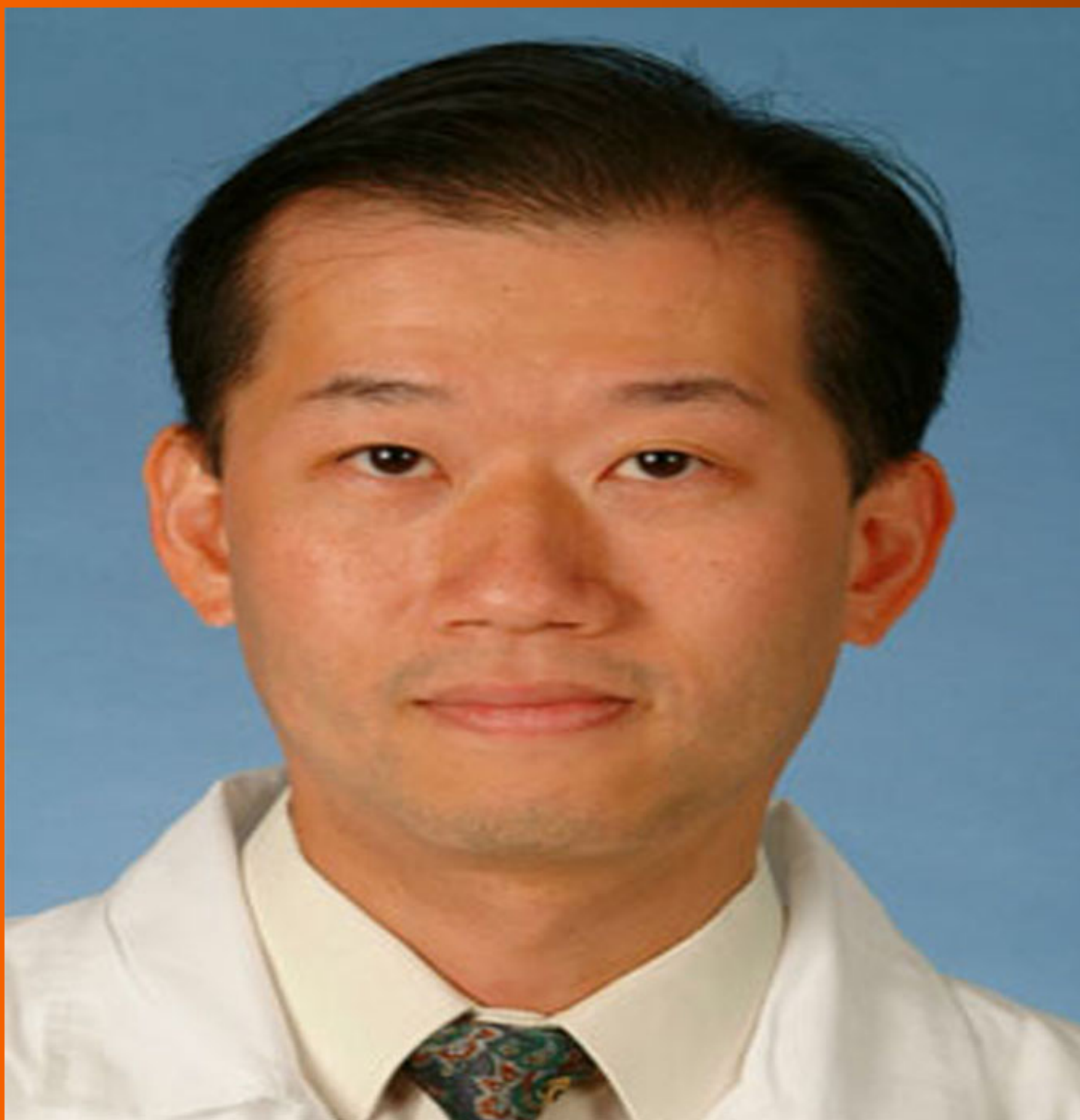


# World Journal of *Clinical Cases*

*World J Clin Cases* 2019 November 6; 7(21): 3384-3682





### EDITORIAL

- 3384** Current controversies in treating remnant gastric cancer: Are minimally invasive approaches feasible?  
*Ma FH, Liu H, Ma S, Li Y, Tian YT*

### ORIGINAL ARTICLE

#### Retrospective Study

- 3394** Efficient management of secondary haemophagocytic lymphohistiocytosis with intravenous steroids and  $\gamma$ -immunoglobulin infusions  
*Georgiadou S, Gatselis NK, Stefos A, Zachou K, Makaritsis K, Rigopoulou EI, Dalekos GN*
- 3407** Impress of intergenerational emotional support on the depression in non-cohabiting parents  
*Jia YH, Ye ZH*
- 3419** Nomograms for pre- and postoperative prediction of long-term survival among proximal gastric cancer patients: A large-scale, single-center retrospective study  
*Chen QY, Hong ZL, Zhong Q, Liu ZY, Huang XB, Que SJ, Li P, Xie JW, Wang JB, Lin JX, Lu J, Cao LL, Lin M, Tu RH, Zheng CH, Huang CM*

#### Observational Study

- 3436** Modified Cortex Mori Capsules improving the successful rate of functional filtering blebs after reclinical glaucoma filtering surgery  
*Yu J, Qiu LX, Qing GP, Zhao BW, Wang H*
- 3446** Effect of cognitive behavior therapy combined with exercise intervention on the cognitive bias and coping styles of diarrhea-predominant irritable bowel syndrome patients  
*Zhao SR, Ni XM, Zhang XA, Tian H*

#### Prospective Study

- 3463** Normal values of shear wave velocity in liver tissue of healthy children measured using the latest acoustic radiation force impulse technology  
*Sun PX, Tong YY, Shi J, Zhang H, Liu SJ, Du J*

### CASE REPORT

- 3524** Retroperitoneal perivascular epithelioid cell tumours: A case report and review of literature  
*Touloumis Z, Giannakou N, Sioros C, Trigka A, Cheilakea M, Dimitriou N, Griniatsos J*

- 3535** First Italian outbreak of VIM-producing *Serratia marcescens* in an adult polyvalent intensive care unit, August-October 2018: A case report and literature review  
*Iovene MR, Pota V, Galdiero M, Corvino G, Di Lella FM, Stelitano D, Passavanti MB, Pace MC, Alfieri A, Di Franco S, Aurilio C, Sansone P, Niyas VKM, Fiore M*
- 3549** Transfemoral aortic valve implantation in the case of pre-existing mitral prosthesis and pure aortic regurgitation: A case report  
*Erdem A, Esen Zencirci A, Ozden K, Terzi S*
- 3553** Methotrexate-related lymphoproliferative disorders in the liver: Case presentation and mini-review  
*Mizusawa T, Kamimura K, Sato H, Suda T, Fukunari H, Hasegawa G, Shibata O, Morita S, Sakamaki A, Yokoyama J, Saito Y, Hori Y, Maruyama Y, Yoshimine F, Hoshi T, Morita S, Kanefuji T, Kobayashi M, Terai S*
- 3562** Re-revision surgery for re-recurrent valgus deformity after revision total knee arthroplasty in a patient with a severe valgus deformity: A case report  
*Du YQ, Sun JY, Ni M, Zhou YG*
- 3569** Liver transplantation for severe portopulmonary hypertension: A case report and literature review  
*Chen XJ, Zhu ZJ, Sun LY, Wei L, Zeng ZG, Liu Y, Qu W, Zhang L*
- 3575** Leiomyosarcoma of the stomach: A case report  
*Kang WZ, Xue LY, Tian YT*
- 3583** Out-of-hospital cardiac arrest in a young adult survivor with sequelae of childhood Kawasaki disease: A case report  
*Zhu KF, Tang LJ, Wu SZ, Tang YM*
- 3590** Squamous cell carcinoma of the nail bed: A case report  
*Li PF, Zhu N, Lu H*
- 3595** Multidisciplinary treatment of a patient with necrotizing fasciitis caused by *Staphylococcus aureus*: A case report  
*Xu LQ, Zhao XX, Wang PX, Yang J, Yang YM*
- 3603** Myocardial ischemic changes of electrocardiogram in intracerebral hemorrhage: A case report and review of literature  
*Lin XQ, Zheng LR*
- 3615** Adenomyoma of the distal common bile duct demonstrated by endoscopic ultrasound: A case report and review of the literature  
*Xu LM, Hu DM, Tang W, Wei SH, Chen W, Chen GQ*
- 3622** Child with Wiskott–Aldrich syndrome underwent atypical immune reconstruction after umbilical cord blood transplantation: A case report  
*Li BH, Hu SY*

- 3632** Epiphyseal distraction and hybrid reconstruction using polymethyl methacrylate construct combined with free non-vascularized fibular graft in pediatric patients with osteosarcoma around knee: A case report  
*Liang YH, He HB, Zhang C, Liu YP, Wan J*
- 3639** Bilateral common carotid artery common trunk with aberrant right subclavian artery combined with right subclavian steal syndrome: A case report  
*Sun YY, Zhang GM, Zhang YB, Du X, Su ML*
- 3649** Giant gastroduodenal trichobezoar: A case report  
*Dong ZH, Yin F, Du SL, Mo ZH*
- 3655** Compound heterozygous mutation of *MUSK* causing fetal akinesia deformation sequence syndrome: A case report  
*Li N, Qiao C, Lv Y, Yang T, Liu H, Yu WQ, Liu CX*
- 3662** Hypoparathyroidism with Fahr's syndrome: A case report and review of the literature  
*Zhou YY, Yang Y, Qiu HM*
- 3671** Primitive neuroectodermal tumors of the abdominal wall and vulva in children: Report of two cases and review of the literature  
*Xu QQ, Xing WW, Chen G, Dang YW, Luo YG, Chen P, Liang SW, Chen JB*

**ABOUT COVER**

Editorial Board Member of *World Journal of Clinical Cases*, Shiu-Yin Cho, MSc, Doctor, Department of Health, 286 Queen's Road East, Hong Kong, China

**AIMS AND SCOPE**

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

**INDEXING/ABSTRACTING**

The WJCC is now indexed in PubMed, PubMed Central, Science Citation Index Expanded (also known as SciSearch®), and Journal Citation Reports/Science Edition. The 2019 Edition of Journal Citation Reports cites the 2018 impact factor for WJCC as 1.153 (5-year impact factor: N/A), ranking WJCC as 99 among 160 journals in Medicine, General and Internal (quartile in category Q3).

**RESPONSIBLE EDITORS FOR THIS ISSUE**

Responsible Electronic Editor: *Yan-Xia Xing*

Proofing Production Department Director: *Xiang Li*

**NAME OF JOURNAL**

*World Journal of Clinical Cases*

**ISSN**

ISSN 2307-8960 (online)

**LAUNCH DATE**

April 16, 2013

**FREQUENCY**

Semimonthly

**EDITORS-IN-CHIEF**

Dennis A Bloomfield, Bao-Gan Peng, Sandro Vento

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

**EDITORIAL OFFICE**

Jin-Lei Wang, Director

**PUBLICATION DATE**

November 6, 2019

**COPYRIGHT**

© 2019 Baishideng Publishing Group Inc

**INSTRUCTIONS TO AUTHORS**

<https://www.wjgnet.com/bpg/gerinfo/204>

**GUIDELINES FOR ETHICS DOCUMENTS**

<https://www.wjgnet.com/bpg/GerInfo/287>

**GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH**

<https://www.wjgnet.com/bpg/gerinfo/240>

**PUBLICATION MISCONDUCT**

<https://www.wjgnet.com/bpg/gerinfo/208>

**ARTICLE PROCESSING CHARGE**

<https://www.wjgnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjgnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>

# Re-revision surgery for re-recurrent valgus deformity after revision total knee arthroplasty in a patient with a severe valgus deformity: A case report

Yin-Qiao Du, Jing-Yang Sun, Ming Ni, Yong-Gang Zhou

**ORCID number:** Yin-Qiao Du (0000-0002-7460-4101); Jing-Yang Sun (0000-0002-9370-8213); Ming Ni (0000-0002-3910-0127); Yong-Gang Zhou (0000-0002-7304-4691).

**Author contributions:** Du YQ wrote this paper. Sun JY was responsible for sorting the data. Ni M and Zhou YG designed this case report. Zhou YG performed the operation.

**Supported by** National Key Research and Development Program of China, No. 2017YFB1104104.

**Informed consent statement:** Informed consent was obtained from the patients included in this case report.

**Conflict-of-interest statement:** The authors declare that there is no conflict of interest involved.

**CARE Checklist (2016) statement:** The authors have read the CARE Checklist (2016), and the manuscripts were prepared and revised according to the CARE Checklist (2016).

**Open-Access:** This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the

Yin-Qiao Du, Jing-Yang Sun, Ming Ni, Yong-Gang Zhou, Department of Orthopedics, General Hospital of Chinese People's Liberation Army, Beijing 100853, China

**Corresponding author:** Yong-Gang Zhou, MD, PhD, Doctor, Department of Orthopedics, General Hospital of Chinese People's Liberation Army, 28 Fuxing Road, Haidian District, Beijing, 100853, China. [ygzhou301@163.com](mailto:ygzhou301@163.com)  
**Telephone:** +86-10-66938404  
**Fax:** +86-10-66938404

## Abstract

### BACKGROUND

A recurrent valgus deformity was a common complication after total knee arthroplasty (TKA) in patients with valgus deformity. However, re-revision surgery for re-recurrent valgus deformity after revision TKA in patients with valgus deformity before primary TKA was uncommon.

### CASE SUMMARY

We reported a 72-year-old female patient with two recurrent valgus deformities after TKA for a valgus knee deformity who underwent two revision surgeries to rectify the deformity. In the re-revision surgery, bone defects were successfully reconstructed by the augments and cement in combination with screws and a sleeve. An appropriate neutral alignment of the lower limb was restored by the perfect femoral entry point and the long diaphyseal cementless stem. Adequate fixation of the metaphysis and diaphysis of the femur was obtained by the sleeve and long diaphyseal cementless stem. The patient was pain-free and deformity-free for 2.5 years.

### CONCLUSION

The management of bone defects, the choice of the stem and the femoral entry point were of vital importance in the revision or re-revision TKA for a recurrent valgus deformity.

**Key words:** Revision total knee arthroplasty; Valgus deformity; Bone defects; Recurrent; Case report

©The Author(s) 2019. Published by Baishideng Publishing Group Inc. All rights reserved.

original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

**Manuscript source:** Unsolicited manuscript

**Received:** July 17, 2019

**Peer-review started:** July 21, 2019

**First decision:** September 9, 2019

**Revised:** September 17, 2019

**Accepted:** September 25, 2019

**Article in press:** September 25, 2019

**Published online:** November 6, 2019

**P-Reviewer:** Ünver B

**S-Editor:** Dou Y

**L-Editor:** Wang TQ

**E-Editor:** Qi LL



**Core tip:** Recurrent valgus deformity was a complication of total knee arthroplasty (TKA) in patients with a severe valgus deformity. It is very difficult to perform the revision TKA. The management of bone defects, the choice of the stem and the femoral entry point were of vital importance in the revision TKA.

**Citation:** Du YQ, Sun JY, Ni M, Zhou YG. Re-revision surgery for re-recurrent valgus deformity after revision total knee arthroplasty in a patient with a severe valgus deformity: A case report. *World J Clin Cases* 2019; 7(21): 3562-3568

**URL:** <https://www.wjcn.com/2307-8960/full/v7/i21/3562.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v7.i21.3562>

## INTRODUCTION

For more than a decade, the number of total knee arthroplasties (TKAs) had been steadily increasing with the increased demand for rectifying deformities and alleviating pain<sup>[1,2]</sup>. However, TKA with valgus deformity was considered a surgical challenge, and the incidence of recurrent valgus deformities was very high<sup>[3]</sup>. The revision surgery for failed TKAs became unusually complex because of the presence of tremendous bone defects of the lateral femoral condyle. While the development of highly porous cones and sleeves has enabled the reconstruction of areas with massive metaphyseal bone defects and the improvement of solid fixations<sup>[4-6]</sup>, the fixation of the diaphyseal stem was also crucial for revision TKA success. The extension of the stem was important in transferring the bending and torsional stresses generated by articulation of the joint away from the joint surface toward the strong diaphyseal bone<sup>[7]</sup>. The length of the diaphyseal stem and the entry point of the femoral intramedullary (IM) rod were the cornerstones of achieving perfect lower limb alignment. Therefore, the management of bone defects, the choice of the stem and the femoral entry point were of vital importance in revision TKA for recurrent valgus deformity. Here, we report a patient with a rare, severe valgus deformity who underwent two revision surgeries for recurrent valgus deformity after TKA.

## CASE PRESENTATION

### Chief complaints

A 72-year-old female patient visited our hospital 6 years after revision surgery for left TKA with a chief complaint of pain, and the pain worsened for 1 mo.

### History of present illness

The patient underwent left primary TKA (NexGen LPS-FLEX, Zimmer, Warsaw, Indiana, United States) and sliding osteotomy of the lateral femur condyle in 2008 for a severe valgus deformity at another institution. Six months later, she again presented with valgus deformity and pain in the left knee. In-house X-rays revealed notable femoral component loosening and recurrent valgus deformity (Figure 1).

Then, the revision of the knee components was performed in 2010 at another institution. The system that the surgeon used was the press fit condylar, Sigma, total condylar III (TC3) system (DePuy, Warsaw, Indiana, United States). All the stems on the femoral and tibial sides were cementless, and the cement that was reinforced with screws was used to reconstruct the defects of the lateral femoral condyle (Figure 2). The patient did not report any serious symptoms for six years. In 2016, she started complaining of knee pain again, and she showed limited movement and valgus deformity.

### History of past illness

She suffered from hypertension for 2 years. Her blood pressure was controlled by using antihypertensive drugs.

### Personal and family history

The patient did not have any specific personal or family history of disease.

### Physical examination upon admission

We evaluated her before re-revision TKA. In the clinical examination, the knee was





**Figure 1** The radiographs of left knee at 6 months after primary total knee arthroplasty showed the signs of femoral component loosening and recurrent valgus deformity. A: Anteroposterior radiograph; B: Lateral radiograph.

equally painful with weight-bearing and passive motions. The range of motion was from 5° to 80° of flexion. There was anterior-posterior laxity of 5-10 mm. With valgus stress, there was a marked medial instability of more than 15°.

### **Laboratory examinations**

The patient was evaluated to rule out infection. The knee was aspirated preoperatively. The synovial red blood cell count was 13-18/HPF, and the synovial white blood cell count, polymorphonuclear (%) and leukocyte esterase were normal. There was no bacterial growth in the aspirate. Likewise, the serum C-reactive protein, erythrocyte sedimentation rate and interleukin 6 were normal. An emission computed tomography scan of the bone in the whole body was also found to be negative for infection.

### **Imaging examinations**

In 2016, X-rays showed loosening of the femoral component and the stem (Figure 3).

## **FINAL DIAGNOSIS**

The final diagnosis included loosening of the components and stem of the femoral side and recurrent valgus deformity in the left knee.

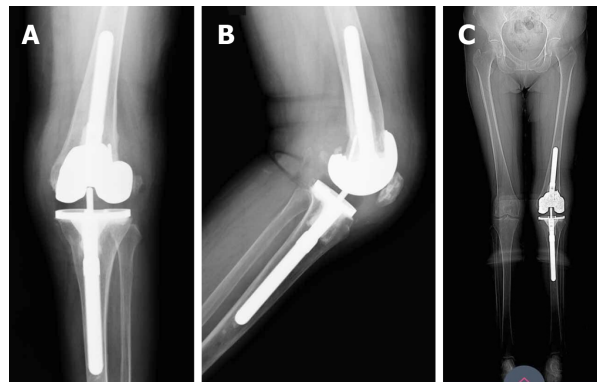
## **TREATMENT**

During surgery, the medial joint space opened widely with valgus stress during flexion and extension. The quadriceps snip technique was used to assist in the surgical exposure of the knee. The components and stem of the femoral side were loosened, and those of the tibial side were well stabilized. After removal of the loose femoral component and stem, we evaluated the intraoperative bone defects (type FIIB) according to the Anderson Orthopaedic Research Institute (AORI) classification (AORI classification of bone defects in revision TKA)<sup>[8]</sup>. The cement reinforced with screws was used to reconstruct the defects of the lateral femoral condyle. A lateral distal femoral block augment (4 mm thick) and posterior femoral augments (the medial and lateral sides were 4 mm and 8 mm thick, respectively) were used to restore the defects of the joint surface and epiphysis. A porous titanium metaphyseal sleeve (size: 40 mm) was used in the treatment of metaphyseal bone defects. A TC3 femoral component (size: 4) in combination with a cementless stem (size: 16 mm × 115 mm), which was engaged in the cortical bone of diaphysis, was implanted with a hybrid fixation. Then, a new constrained polyethylene liner (17.5 mm) was placed in the tibial component plate (Figure 4).

## **OUTCOME AND FOLLOW-UP**

Postoperative X-rays confirmed excellent placement of the components after left TKA (Figure 5). Continuous passive motions and partial weight-bearing actions with a





**Figure 2** The radiographs after revision total knee arthroplasty showed residual valgus deformity. A: Anteroposterior radiograph; B: Lateral radiograph; C: The standing hip-to-ankle anteroposterior radiograph.

walking aid were initiated on the second postoperative day, and the range of motion was gradually increased to 0°-90° of flexion. The patient had no postoperative complications and was discharged from the hospital on postoperative day 4. Physical therapy stressed a gentle range of motion and strengthening exercise with no forced flexion. Four weeks after surgery, she gradually resumed full weight-bearing activities.

Following this surgery, the patient made an eventful recovery, and 2.5 years have now passed after the re-revision TKA. She was satisfied with her knee, with a hospital for special surgery score of 84 (preoperative score: 31), was pain-free, and had a range of motion of 0°-100° of flexion. The X-rays showed that the left knee arthroplasty was in the expected position with no radiographic signs of loosening (Figure 6).

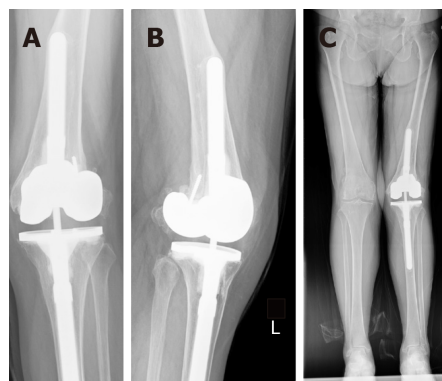
## DISCUSSION

We presented an experience with a 72-year-old female patient with two recurrent valgus deformities after TKA for a valgus knee deformity. The patient underwent two revision surgeries because of the recurrent valgus deformity.

A primary TKA for a valgus knee deformity represented a challenge for orthopaedic surgeons, especially beginners<sup>[9,10]</sup>. Nikolopoulos *et al*<sup>[9]</sup> presented in his review article several complications that have been reported more frequently in patients with a valgus knee deformity who underwent TKA, and the incidence of recurrent valgus deformity ranged from 4% to 38%. A recurrent valgus deformity could result in massive bone defects of the lateral femoral condyle. For large or uncontained defects, including AORI type II, treatment alternatives include modular augments, the cement reinforced with screws and porous titanium metaphyseal sleeve. Distal and posterior femoral defects managed with modular augments allow for the placement of well-positioned and correctly sized femoral components in contact with host bone<sup>[11]</sup>, and posterior femoral augments are particularly useful in restoring the proper anteroposterior dimension of the component, achieving the correct rotation of the femoral component and addressing the extension-flexion mismatch by altering the flexion gap<sup>[12]</sup>. Porous titanium metaphyseal sleeves with a stepped shape and titanium bead coating were easy to use for fixation by bone ingrowth and were available to fill the metaphyseal defects. The femoral component was attached to the sleeve through the Morse junction on the instrument<sup>[13]</sup>. Although many authors recommended the use of cement in combination with screws in cases of contained or uncontained defects between 5 mm and 10 mm, we still used the cement to reconstruct the massive defects of the lateral femoral condyle. According to zonal fixation concepts, solid fixation should be achieved in at least two of three zones<sup>[14]</sup>. The cementless stem and metaphyseal sleeve at least helped in promoting an additional fixation in the metaphysis (zone 2) and diaphysis (zone 3) of femur, so the cement in combination with screws was safe to use to reconstruct the lateral femoral condyle.

We analysed the causes of failure of the revision TKA and considered the invalid entry point of the femoral IM rod and the short cementless stem as the main causes.

According to the postoperative X-rays after revision TKA, the entry point of the femoral IM rod was located at the centre of the coronal plane and posterior to the centre of the femoral marrow cavity in the sagittal plane, which resulted in residual valgus deformity, gross flexion-extension mismatch and loading stresses on the lateral



**Figure 3** The radiographs at 6 years after revision total knee arthroplasty showed signs of the loosening of femoral components and recurrent valgus deformity, and the femoral cementless stem broke through the cortical bone of femur. A: Anteroposterior radiograph; B: Lateral radiograph; C: The standing hip-to-ankle anteroposterior radiograph.

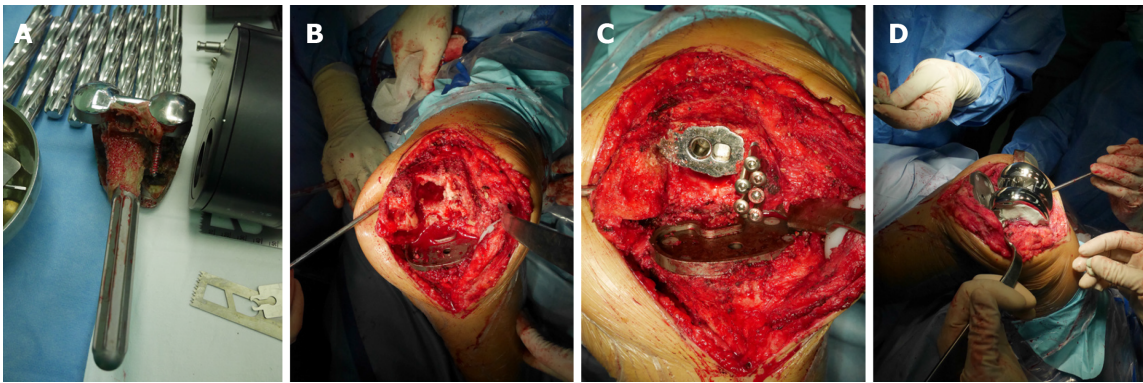
femoral condyle and ultimately led to the failure of the reconstruction of the lateral femoral condyle. Tan *et al*<sup>[15]</sup> suggested that the femoral entry point should be located medial to the centre of the knee joint in the coronal plane for a valgus knee arthroplasty. In the re-revision surgery, we adjusted the entry point of the femoral IM rod to be medial of the centre of the joint in the coronal plane (the intersection of the anatomical axis and the distal femoral joint line) and in the centre of the femoral marrow cavity in the sagittal plane, restoring the neutral alignment of the lower limb.

While augments and sleeves greatly enhanced the modern surgeon's ability to gain solid fixation in metaphyseal bone, stems continue to be useful in revision TKA to bypass defects and enhance the structural stability of revision components<sup>[16]</sup>. In revision surgery, the surgeon chose a cementless stem to bypass the metaphyseal defect. However, the stem was too short and thin to achieve solid fixation in the diaphysis (zone 3) of the femur. In the re-revision surgery, we used a long diaphyseal cementless stem, which engaged in the cortical bone of diaphysis, to transfer loads to the diaphysis and reduce micromotions. The long diaphyseal cementless stem not only assisted in offloading interface stresses but also guided the IM rod to prevent malalignment<sup>[17,18]</sup>.

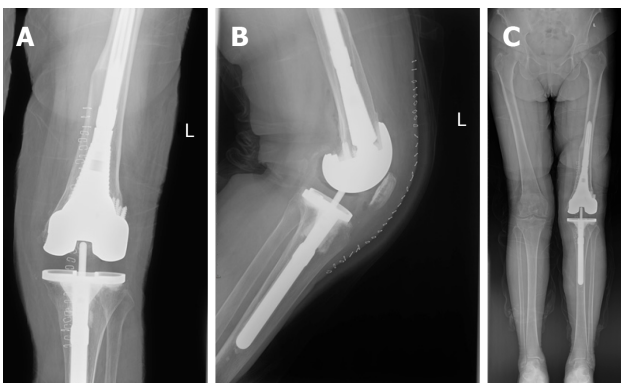
When the joint surface and epiphysis (zone 1) were inadequate, fixation of the metaphysis (zone 2) and diaphysis (zone 3) of the femur became particularly important. In this case, the insufficient fixation of the metaphysis and diaphysis were reasons the revision TKA failed. The invalid entry point of the femoral IM rod and the short cementless stem, which led to lower limb malalignment, were major causes of failure and re-revision surgery.

## CONCLUSION

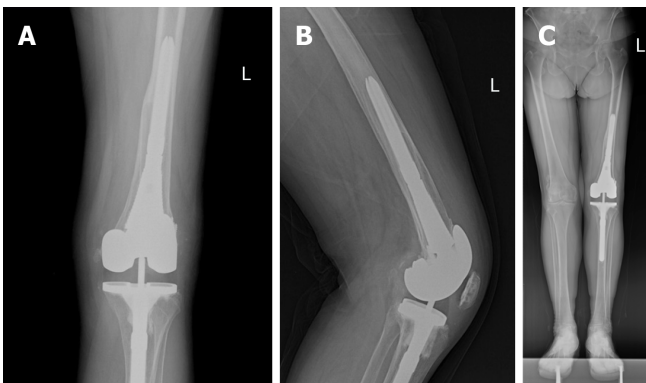
Recurrent valgus deformity was the most commonly reported complication after TKA for a valgus knee deformity, leading to massive bone defects of the lateral femoral condyle. The restoration of bone defects, component stability and perfect lower limb alignment were the main challenges in the revision or re-revision TKA. Bone defects were successfully reconstructed by the augments, the cement in combination with screws and the sleeve. An appropriate neutral alignment of the lower limb was restored by the perfect entry point of the femoral IM rod and the long diaphyseal cementless stem. Adequate fixation of the metaphysis and diaphysis of the femur was obtained by the sleeve and the long diaphyseal cementless stem. All these factors were the cornerstones of the success of this case.



**Figure 4 Intraoperative images.** A: Removal of femoral components from the previous revision and the cementless stem; B: Tremendous bone defects (type FB) in the lateral femoral condyle; C: The screws were used to reconstruct the defects of the lateral femoral condyle; D: A total condylar femoral component with a sleeve that was implanted with a hybrid fixation and the cement reinforced with screws was used to reconstruct the defects of the lateral femoral condyle.



**Figure 5 The radiographs after re-revision total knee arthroplasty.** The positions of the components were satisfactory based on the radiographs, and an appropriate neutral alignment of the lower limb was restored. A: Anteroposterior radiograph; B: Lateral radiograph; C: The standing hip-to-ankle anteroposterior radiograph.



**Figure 6 The radiographs at 2.5 years after re-revision total knee arthroplasty.** The left knee arthroplasty was in the expected position with no radiographic signs of loosening. A: Anteroposterior radiograph; B: Lateral radiograph; C: The standing hip-to-ankle anteroposterior radiograph.

## REFERENCES

- 1 Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am* 2007; **89**: 780-785 [PMID: 17403800 DOI: 10.2106/jbjs.f.00222]
- 2 Patel A, Pavlou G, Mújica-Mota RE, Toms AD. The epidemiology of revision total knee and hip arthroplasty in England and Wales: a comparative analysis with projections for the United States. A study using the National Joint Registry dataset. *Bone Joint J* 2015; **97-B**: 1076-1081 [PMID: 26224824 DOI: 10.1302/0301-620X.97B8.35170]
- 3 Rossi R, Rosso F, Cottino U, Dettoni F, Bonasia DE, Bruzzone M. Total knee arthroplasty in the valgus

- knee. *Int Orthop* 2014; **38**: 273-283 [PMID: [24366186](#) DOI: [10.1007/s00264-013-2227-4](#)]
- 4 **Thorsell M**, Hedström M, Wick MC, Weiss RJ. Good clinical and radiographic outcome of cementless metal metaphyseal sleeves in total knee arthroplasty. *Acta Orthop* 2018; **89**: 84-88 [PMID: [29105554](#) DOI: [10.1080/17453674.2017.1398013](#)]
- 5 **Sandiford NA**, Misur P, Garbuz DS, Greidanus NV, Masri BA. No Difference Between Trabecular Metal Cones and Femoral Head Allografts in Revision TKA: Minimum 5-year Followup. *Clin Orthop Relat Res* 2017; **475**: 118-124 [PMID: [27287857](#) DOI: [10.1007/s11999-016-4898-9](#)]
- 6 **Sheth NP**, Bonadio MB, Demange MK. Bone Loss in Revision Total Knee Arthroplasty: Evaluation and Management. *J Am Acad Orthop Surg* 2017; **25**: 348-357 [PMID: [28406878](#) DOI: [10.5435/JAAOS-D-15-00660](#)]
- 7 **Completo A**, Simões JA, Fonseca F. Revision total knee arthroplasty: the influence of femoral stems in load sharing and stability. *Knee* 2009; **16**: 275-279 [PMID: [19299144](#) DOI: [10.1016/j.knee.2008.12.008](#)]
- 8 **Engh GA**, Ammeen DJ. Classification and preoperative radiographic evaluation: knee. *Orthop Clin North Am* 1998; **29**: 205-217 [PMID: [9553566](#) DOI: [10.1016/S0030-5898\(05\)70319-9](#)]
- 9 **Nikolopoulos D**, Michos I, Safos G, Safos P. Current surgical strategies for total arthroplasty in valgus knee. *World J Orthop* 2015; **6**: 469-482 [PMID: [26191494](#) DOI: [10.5312/wjo.v6.i6.469](#)]
- 10 **Favorito PJ**, Mihalko WM, Krackow KA. Total knee arthroplasty in the valgus knee. *J Am Acad Orthop Surg* 2002; **10**: 16-24 [PMID: [11809047](#) DOI: [10.1016/j.otsr.2010.03.009](#)]
- 11 **Sculco PK**, Abdel MP, Hanssen AD, Lewallen DG. The management of bone loss in revision total knee arthroplasty: rebuild, reinforce, and augment. *Bone Joint J* 2016; **98-B**: 120-124 [PMID: [26733657](#) DOI: [10.1302/0301-620X.98B1.36345](#)]
- 12 **Vasso M**, Beaufils P, Cerciello S, Schiavone Panni A. Bone loss following knee arthroplasty: potential treatment options. *Arch Orthop Trauma Surg* 2014; **134**: 543-553 [PMID: [24519708](#) DOI: [10.1007/s00402-014-1941-8](#)]
- 13 **Agarwal S**, Neogi DS, Morgan-Jones R. Metaphyseal sleeves in revision total knee arthroplasty: Minimum seven-year follow-up study. *Knee* 2018; **25**: 1299-1307 [PMID: [30297257](#) DOI: [10.1016/j.knee.2018.09.010](#)]
- 14 **Morgan-Jones R**, Oussedik SI, Graichen H, Haddad FS. Zonal fixation in revision total knee arthroplasty. *Bone Joint J* 2015; **97-B**: 147-149 [PMID: [25628273](#) DOI: [10.1302/0301-620X.97B2.34144](#)]
- 15 **Tan H**, Wang Y, Long T, Nie B, Mao Z, Yue B. How to accurately determine the distal femoral valgus cut angle in the valgus knee arthroplasty. *Int Orthop* 2018; **42**: 537-542 [PMID: [29356933](#) DOI: [10.1007/s00264-018-3778-1](#)]
- 16 **Driesman AS**, Macaulay W, Schwarzkopf R. Cemented versus Cementless Stems in Revision Total Knee Arthroplasty. *J Knee Surg* 2019; **32**: 704-709 [PMID: [30736057](#) DOI: [10.1055/s-0039-1678686](#)]
- 17 **Mancuso F**, Beltrame A, Colombo E, Miani E, Bassini F. Management of metaphyseal bone loss in revision knee arthroplasty. *Acta Biomed* 2017; **88**: 98-111 [PMID: [28657571](#)]
- 18 **Huten D**. Femorotibial bone loss during revision total knee arthroplasty. *Orthop Traumatol Surg Res* 2013; **99**: S22-S33 [PMID: [23333128](#) DOI: [10.1016/j.otsr.2012.11.009](#)]



Published By Baishideng Publishing Group Inc  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA  
Telephone: +1-925-2238242  
E-mail: [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)  
Help Desk: <https://www.f6publishing.com/helpdesk>  
<https://www.wjgnet.com>

