

PALLIATIVE A/S DEBRIDEMENT WITH CONTINUOUS IRRIGATION FOR THE INFECTION TKA OF HIGH MORTALITY RISK PATIENTS

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.



INTRODUCTION

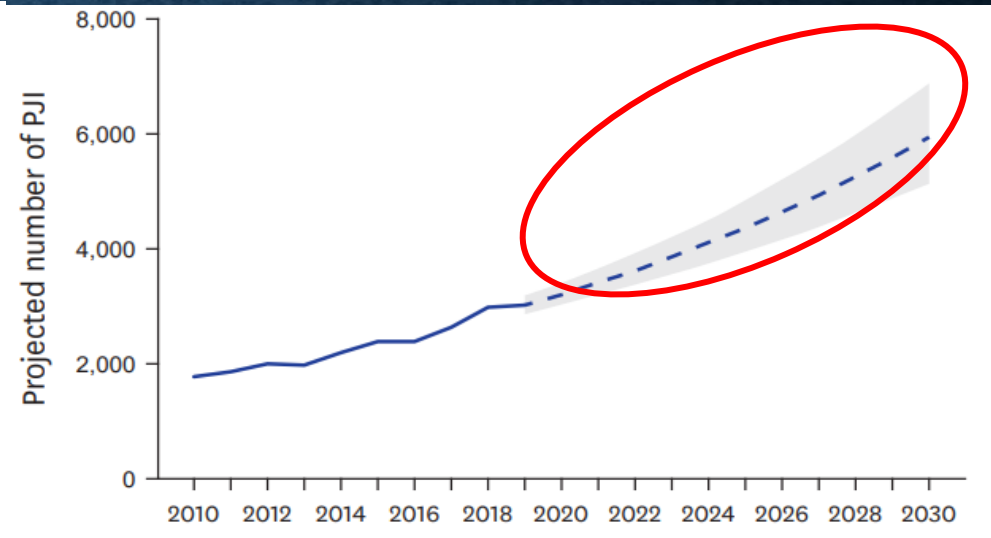
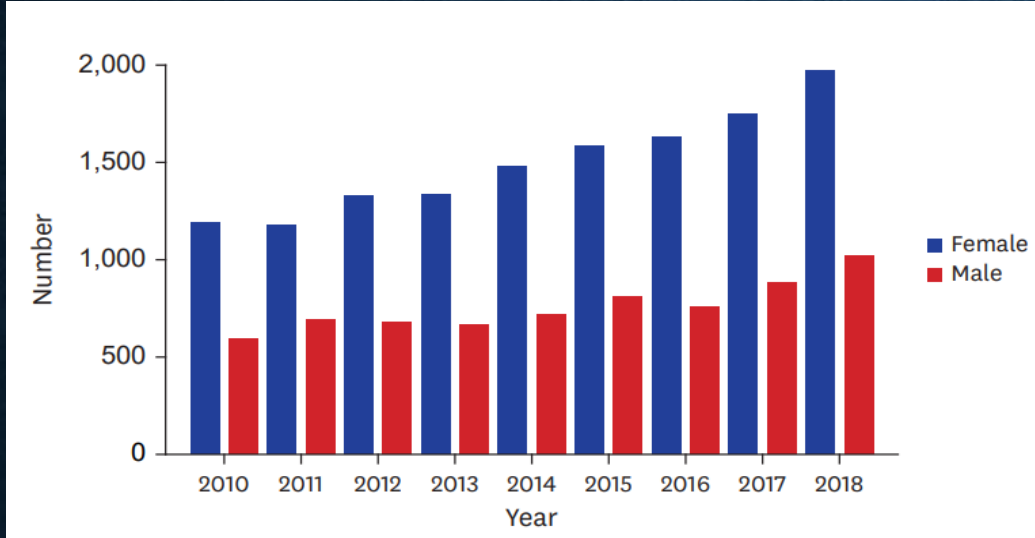


Table 1. Number of total joint arthroplasties and periprosthetic joint infections with their ratio in Korea from 2010 to 2018

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
THA	7,657	7,917	8,673	9,278	9,520	10,357	11,036	11,227	11,548
TKA	65,109	65,742	71,220	72,349	72,818	80,656	91,282	91,736	95,385
PJI	1,786	1,869	2,004	1,993	2,200	2,389	2,390	2,629	2,989
PJI/TJA ratio, %	2.5	2.5	2.5	2.4	2.7	2.6	2.3	2.6	2.8

THA = total hip arthroplasty, TKA = total knee arthroplasty, TJA = total joint arthroplasty, PJI = periprosthetic joint infection.

△ The burden of TKA infection continues to rise due to an aging society.

INTRODUCTION

- Gold standard for infection TKA : 2nd stage revision with antibiotics loaded cement spacer

JY Chung et al. Arthroscopy. 2014

- **Mortality** : 6 times higher after **septic** revision (18%) > aseptic revision (3%).
- **Age, higher ASA class**, and **septic** revision were predictors of increased mortality.

HR Choi et al. Arthroplasty. 2014

- **Old age, greater comorbidity**, DM, **septic revision**

⇒ increased risk of mortality after revision TKA.

- Notably, 1 in 80 patients aged 80-89 years died after revision TKA within 30d.

SaTia T. Sinclair. Arthroplasty today. 2021

INTRODUCTION

- **How can we manage the high mortality risk patients of infection TKA?**

- Only IV or oral antibiotics : failure risk ↑ , **draining sinus, soft tissue problem, general S/E**
- Debridement, Antibiotics and implant retention (**DAIR**) : alternative Tx. Option
- Debate on clinical outcomes of DAIR

Open VS. A/S / **DAIR VS. 2nd stage revision**

JC Sherrell et al. CORR. 2011 /Ö Öztürk et al. Arthroplasty 2020

- For High mortality Pt.

: **need to maintain comfortable life by alleviating pain and symptoms** rather than improving the disease.

⇒ **consider palliative management**

- No clinical study of palliative purpose of A/S DAIR

PURPOSE

- Assess the infection control rate and clinical outcomes of A/S debridement with continuous irrigation for the high mortality risk or terminal cancer stage patients.



METHODS

- **Indication**

- 1) Old age (≥ 80),
- 2) terminal status due to malignancy, ($2Y < \text{Life expectancy}$)
- 3) High risk of mortality and morbidity (e.g., ESRD, LC, CAOD, cardiac valve disease, AAA : **Charlson cormobidity index ≥ 5**),
- 4) Low daily activity with disabled extremity or 5) re-infection after 2nd stage revision TKA.

- The need for subsequent A/S re-debridement

: post OP **trends of CRP levels** and **joint fluid analysis**.

- **Infection control (\neq eradication)**

: defined as continuing controlled infection based on clinical and laboratory test by 1 or 2 times A/S

SURGICAL PROCEDURE

(A) Initial finding through SL portal. Lots of infectious debris were found.

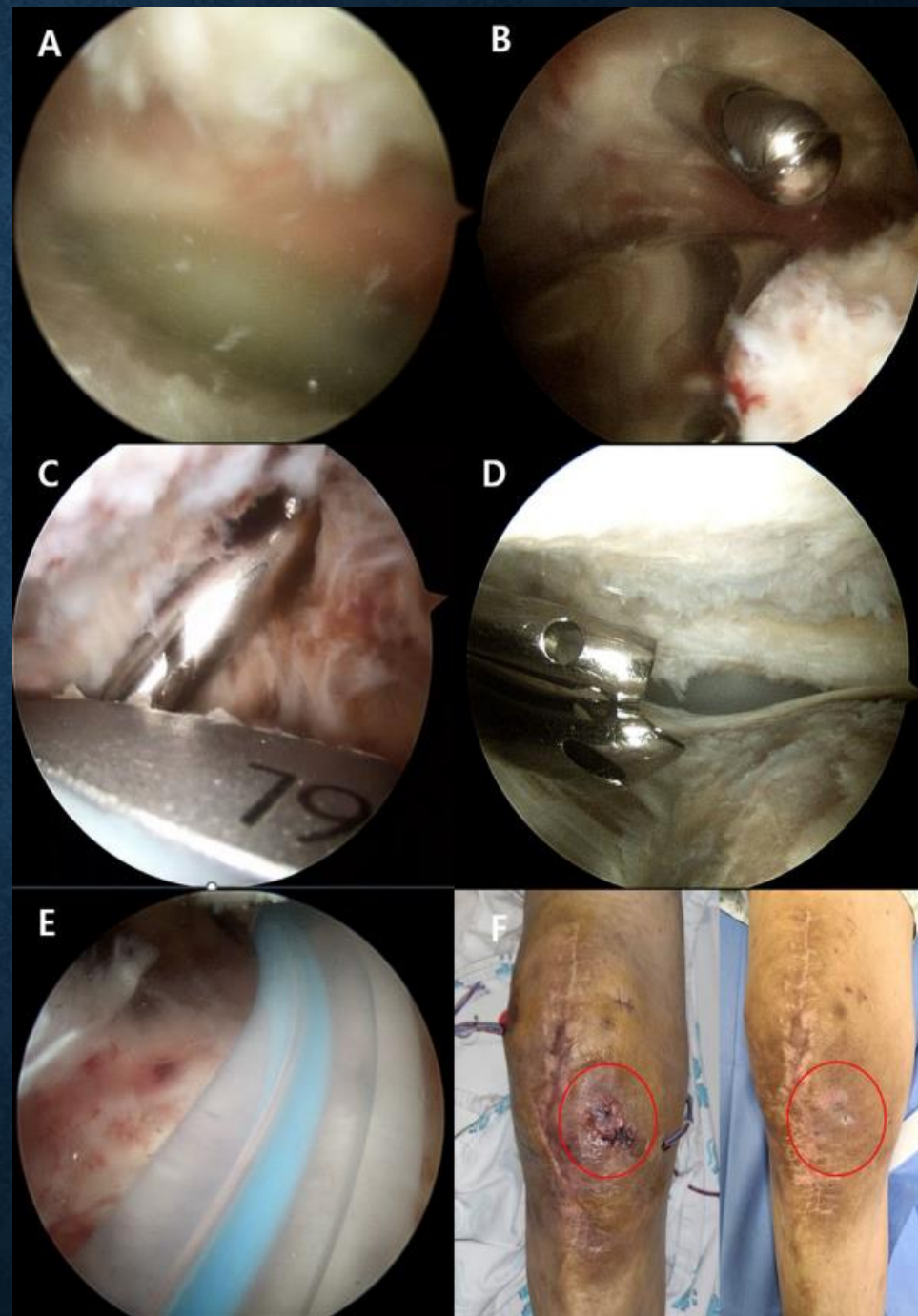
(B) After multiple **infectious synovial tissues Bx.** / debridement and irrigation using SM, AL, AM, PM portal.

(C) If possible, debridement also performed at draining sinus.

(D) Continue irrigation while performing knee flexion-extension motion until the intra-articular space is completely cleared.

(E) Finally, a continuous irrigation system is placed in the joint cavity (infow: SM portal, outflow: SL or AL portal).

(F) The previous draining sinus completely healed at 3 weeks after surgery



RESULTS

- Mean age : **79.6 Y** (range: 65 – 98)
- Mean symptom period : 16.8d (range: 2-60d)
- Mean time after primary TKA : 6.3 Y (range: 0.8-18Y)
- Mean Charlson comorbidity index : **7.62** (range: 4-12)
- Mean OP time : 61.9m (both knee: 112.3m)
- Post OP ambulation w/without walker: POD 5.4d (range: 3-12d)
- Normalized CRP : 35.3d (range: 14-118d)
- Transfusion : none

Confirmed organism	Number of cases
MSSA	4
MRSA	2
<i>Streptococcus dysgalactiae</i>	4
<i>Streptococcus agalactiae</i>	3
<i>E. coli</i>	2
Methicillin-resistant <i>Staphylococcus epidermidis</i>	1
β -Hemolytic streptococcus	1
<i>Candida albicans</i>	1
Not confirmed	2

RESULTS

- **Clinical outcomes**

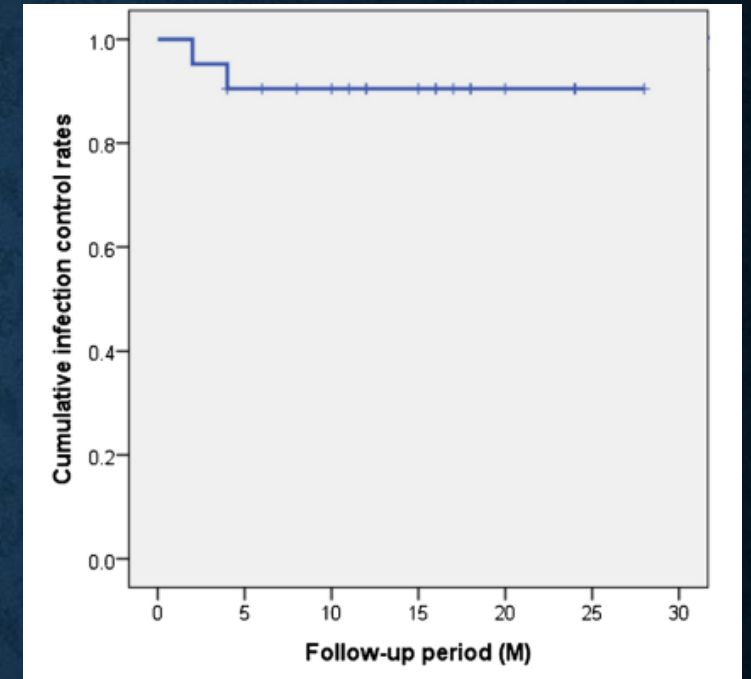
- : Repeated A/S debridement : 3 cases

- total 3 times A/S debridement : 1 case

- recur : 1 case (need 2nd stage revision TKA)

- : **infection controlled** – 19 cases /21 (90.5%)

- 4 patients expired due to underlying medical problems (3: cancer, 1: congestive heart failure)
- No patient was expired due to uncontrolled infection or sepsis.



DISCUSSION

- **A/S DAIR** is a good alternative to open DAIR **with lower morbidity**

: 1) avoid arthrotomy with **damage to the extensor apparatus**.

2) reduce wound healing problems and a **faster recovery**.

3) reduced the risk of lots of **bleeding and transfusion**.

4) in the case of an old TKA, the P/E **liner may not be in stock**.

Carlos A. et al. EFORT Open Reviews. 2019

- Comparable outcomes of infection control rate in current study (90.5%)

VS. 2nd stage revision eradication (54-100%, avg. 84.8%)

C. Pangaud et al. EFORT Open Reviews. 2019

- For palliative surgery : minimize injury risk, reduce OP time

⇒ **extensive irrigation with ROM action + continuous irrigation**

CONCLUSION

- For high mortality risk infection TKA patients,
A/S debridement with continuous irrigation can be an alternative treatment
that can improve the quality of life during survival.



REFERENCES

- 1) Kim HS, Park JW, Moon S-Y et al (2020) Current and future burden of periprosthetic joint infection from national claim database. J Korean Med Sci 35:e410.
- 2) Royo A, Bertrand ML, Ramos L et al (2013) Is there still a place for continuous closed irrigation in the management of periprosthetic total knee infection? Open Orthop J 7:205–210
- 3) Qu G-X, Zhang C-H, Yan S-G, Cai X-Z (2019) Debridement, antibiotics, and implant retention for periprosthetic knee infections: a pooling analysis of 1266 cases. J Orthop Surg Res 14:358.
- 4) Chung JY, Ha C-W, Park Y-B et al (2014) Arthroscopic debridement for acutely infected prosthetic knee: any role for infection control and prosthesis salvage.? Arthroscopy: J Arthrosc Relat Surg 30:599–606
- 5) Dixon P, Parish EN, Cross MJ (2004) Arthroscopic debridement in the treatment of the infected total knee replacement. J Bone Joint Surg British 86:39–42
- 6) Sherrell JC, Fehring TK, Odum S et al (2011) The Chitranjan Ranawat award: fate of two-stage reimplantation after failed irrigation and débridement for periprosthetic knee infection. Clin Orthop Relat Res 469:18–25.
- 7) Xu Y, Wang L, Xu W (2020) Risk factors affect success rate of debridement, antibiotics and implant retention (DAIR) in periprosthetic joint infection. Arthroplasty 2:37
- 8) Haddad FS, Sukeik M, Alazzawi S (2015) Is single-stage revision according to a strict protocol effective in treatment of chronic knee arthroplasty infections? Clin Orthop Relat Res 473:8–14.