



EDITORIAL

Periarticular joint infection: Survey of the European Knee Associates (EKA) of ESSKA

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The following issue covers three main topics: periprosthetic joint infection (PJI), revision after total knee arthroplasty (TKA), and outcome assessments after TKA. A very important question is how to deal with PJI, because it is one of the most devastating outcomes for patients after TKA. Patients suffer significant limitations in their activities of daily living often due to pain, which may affect them for

prolonged periods of time. On the other hand, the treatment of PJI can be a heavy burden for the orthopaedic surgeon, as most surgeons agree that these patients routinely require very special care.

The treatment of PJI is challenging and requires complex concepts in order to treat these patients successfully. The infection rate after TKA ranges from 1 to 4 % [2, 4, 7].

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The incidence of late infection is below 0.1 % [4]. Infection has become the most common reason for revision after TKA and accounts for approximately 25 % of revisions [1, 5, 8]. The virulence of infectious organisms is continuously changing, and resistance is increasing, which makes successful treatment of PJI even more difficult. For that reason, the European Knee Associates of ESSKA performed a survey throughout Europe and 262 surgeons responded. There was a special focus on the management of early and late PJI.

Of the 262 respondents, 25.2 % stated they performed <50 primary TKA per year, 32.4 % performed 50–100 primary TKA/year, 27.1 % performed 100–200 primary TKA/year, and 15.3 % performed >200 TKA/year. The types of cases performed include primary TKA (257/262, 98.1 %), unicompartmental knee arthroplasty (UKA, 237/262, 90.5 %), semiconstrained TKA (232/262, 88.6 %), and hinged knee prostheses (227/262, 86.6 %). With regards to revisions, almost all surgeons revised primary TKA (258/262, 98.5 %), 72.5 % revised UKA, 72.1 % revised semiconstrained TKA, and 66.8 % revised hinged knee prostheses.

For an early PJI of less than 3 months duration, the majority of respondents (81.3 %, 213/262) stated that they would perform a debridement and polyethylene exchange. This was followed by a one-stage exchange arthroplasty (29.8 %, 78/262), a two-stage exchange arthroplasty (18.3 %, 48/262), and arthroscopic debridement (11.8 %, 31/262). Of the 48 respondents who would perform a two-stage exchange arthroplasty for a PJI <3 months, 65.9 % surgeons stated that they would perform the second stage within 6 weeks, while 34.1 % would perform the surgeries 3 months apart. Finally, 50.0 % would wait until serum markers returned to normal before performing the second stage. Low volume surgeons were more likely to perform irrigation and debridement and modular component exchanges (85.2 %) than high volume surgeons (79.4 %) in early PJI cases ($p = 0.002$). However, high volume surgeons (26.8 %) were more likely to perform one-stage exchange arthroplasty with a known organism than low volume surgeons (16.1 %) in early PJI ($p = 0.01$). For all other modalities of treatment for early PJI, low and high volume surgeons were similar ($p = \text{n.s.}$).

For a delayed PJI of greater than 3 months duration, the most common surgical treatment method was two-stage exchange arthroplasty (56.5 %, 148/262), which was followed by one-stage exchange arthroplasty (30.5 %, 80/262), debridement, and polyethylene exchange (9.5 %, 25/262). Still 1.9 % of the surgeon would consider arthroscopic debridement. Of the 148 respondents who would perform a two-stage exchange arthroplasty >3 months, 65.5 % would use a mobile or dynamic spacer, 31.1 % would use a static spacer, and 3.4 % would use external fixation. Faschingabauer et al. [3] noticed a 15 %

complication rate when using static spacer. A systematic review of the literature showed no difference in the re-infection rate between static and articulating spacer [10]. However, better range of motion after reimplantation was found in the articulating group.

With regards to delayed PJI, 62.1 % surgeons stated that they would perform the second stage within 6 weeks, while 37.9 % would perform the surgeries 3 months apart. Finally, more surgeons (64.9 %) would wait until serum markers were normal before performing the second stage in a delayed PJI. Finally, for delayed PJI, there was no difference in treatment between high and low volume surgeons ($p = \text{n.s.}$).

With regards to antibiotic treatment, 24.1 % stated that they would administer antibiotics before surgery for an early (<3 month) infection, while only 9.5 % would administer antibiotics before surgery for a late (>3 month) infection. The majority of surgeons surveyed (87.8 %, 230/262) would consult an infectiologist for treatment, and 80.6 % differentiate their antibiotic regimen according to the resistogram.

For the duration of antibiotic treatment, respondents stated that they administer intravenous (IV) antibiotics for an average of 19 days \pm 18 after an early infection, 24 days \pm 20 after a late infection, 19 days \pm 18 for a sensitive organism, and 30 days \pm 22 for a resistant organism. For oral antibiotics subsequent to IV antibiotics, surgeons administer an average of 47 days \pm 37 oral antibiotics for early infections, 61 days \pm 55 for late infections, 46 days \pm 36 for sensitive organisms, and 67 days \pm 59 for resistant organisms. Of note, 17 respondents (6.5 %) stated that C-reactive protein levels must return to normal before stopping IV antibiotics, while 21 respondents (8.0 %) said the same for stopping oral antibiotics. For both IV and oral antibiotics, 14 would determine antibiotic duration based on culture results, and 13 relied on their infectious disease specialists to determine antibiotic duration.

Finally, for the second stage of a two-stage revision or reimplantation of the total knee prosthesis, most surgeons (64.5 %, 169/262) would perform it after an antibiotic-free interval, while 43 surgeons (16.4 %) would perform two-stage exchange arthroplasty under continuous antibiotic therapy. Only 34.0 % (89/262) of surgeons wait for a negative joint aspirate to initiate the second stage of surgery, while 9.9 % (26/262) surgeons will only perform a second stage after a negative open biopsy.

The survey demonstrated that there is still a demand for the development of guidelines in the management of PJI with regards to surgery and antibiotic therapy.

In the last part of the current issue, manuscripts focus on the clinical assessment of patients, which is a very difficult subject to study. How can we be sure that patient assessment provides us with the information we are asking for?

The study by van Hove et al. [9] published in this issue showed that the Oxford knee score (OKS) seems to be more related to pain and provides less information about function. The authors state that it “is important to know when OKS is used as a patient related outcome measure”. Patients after bilateral total knee arthroplasty were studied in another paper [6]. The knees were grouped in “best” and “worst”. The interesting find was that no difference in joint awareness was noticed between the “best” and “worst” knees. Both studies demonstrate that there is still a wide field of research available in order to develop tools, which will allow orthopaedic surgeons to assess patient outcomes in a more objective way.

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