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Editorial

In My Experience…Cementless Total Knee Arthroplasty

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The author presents here her experiences with adopting cementless total knee arthroplasty.

We are in the modern era of cementless knee fixation. In the previous generation, there was a high failure rate in cementless total knee arthroplasties (TKAs), mostly OF the tibial component. I'm a part of a generation where cementless TKAs now have a good track record, as demonstrated by the American Joint Replacement Registry (Nam et al. 2023) and a high survivorship rate comparable to cemented TKA (Hannon et al. 2023; Nam et al. 2019).

When I started doing robotic TKAs, that's really when I started embracing more and more cementless implementation. The cuts made by the robot were very precise, flat and accurate, and utilizing cementless implants was ideal. I started doing cementless TKAs in younger, male patients with good bone quality to allow for biological ingrowth. I have expanded my indications over time, but I do not perform all of my TKAs cementlessly.

Concerning the key factors of cementless arthroplasty, there's patient and surgeon benefits.

SURGEON PERSPECTIVE

> It saves operating room time if there is no need to wait for cement mixing and for cement to harden, especially if one retrials the polyethylene and removes extra cement before inserting the final polyethylene. There's also less anesthesia time for the patient because of that.
>
> There can also be an advantage to the removal of cementless implants. If you have a cementless implant, there is no extra interface between cement and bone and there is no cement to remove. Therefore, if you are revising for infection, it may be difficult to remove all the cement if you have a cemented implant, but there is likely less bioburden when you have a cementless implant.

PATIENT PERSPECTIVE

> It's beneficial for biologic ingrowth, as bone ingrowth holds the promise of less failure at the bone-implant interface. This is especially helpful in younger patients with good bone density and the need for implants to last a long duration of time.
>
> With cementless knees, I stopped using tourniquets. Without tourniquet use, there is less swelling and postoperative pain.

COST

The use of cementless knees can decrease costs, especially in the ASC setting. There is less need for equipment such as cement guns and bowls, since you do not need to mix cement. There is also less need to stock cement if performing cementless TKA.

Cementless knees also take less operative time, and shorter operative time is critical in the ASC setting (Lawrie et al. 2019). From an efficiency point of view, if you save 10 to 15 minutes a case by using cementless knees, that could

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mean you may be able to add on another case at the end of the day, which is really beneficial. While cementless implants may cost a little more, there is typically negotiation for implant costs, and the cost differential of time and less need for cement equipment can make a difference in costs.

TIPS & TRICKS

There are five main areas to test the integrity of a cementless TKA:

1. When I'm performing cementless TKAs robotically, I do the first test for bone quality when I'm putting the tibial checkpoint in.
2. The second test for bone quality is when I'm performing the saw cuts. If the saw blade passes easily, the patient would likely benefit from a cemented TKA
3. The third test is a trick by Dr. Michael Meneghini from Indiana. He does four-corner testing on the trial tibia tray where he pushes on all four sides of the tibia tray individually to make sure there's no rocking, as one should only implant a cementless implant on a very flat, uniform surface.
4. When I'm implanting the tibia, I impact it, then pull it upwards. If the implant comes out when pulling it upwards, then it should be converted to a cemented implant. For the implant system I use, the tibia is the same cemented and cementless, so I can use the same implant and cement it in. I do the same test for the femur – where I insert the implant, then pull perpendicular to the implant to see if the implant can be removed.
5. When checking the distance between the implant and bone, Dr. Kimberly Tucker has a trick where she checks to make sure that a scalpel blade does not pass between the implant and bone.

SUMMARY

There are multiple benefits to using cementless TKA implants, as there are various surgeon and patient advantages. However, cementless TKA fixation is not for everyone – patients have different levels of bone quality that may not be amenable to cementless fixation. Using the tips and tricks above can help with implanting cementless TKA implants, and starting with patients who will be good candidates for cementless fixation may be beneficial in practice. Over time, one can expand the indications for cementless TKA – I used to only perform cemented TKA and now, it's upwards of 70% of my practice.

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