



BILATERAL KNEE REPLACEMENT



Dr Keith Holt

Bilateral Total Knee Replacement is now a commonly performed procedure. Experience with this has shown this to be a safe, reliable procedure, with excellent outcomes, perhaps even exceeding isolated single knee replacement in terms of range of motion and function. Compared to unilateral replacement, it requires only 1 day longer in hospital, a similar amount of analgesia post surgery, a similarly very low risk of blood transfusion, and just a week or 2 longer off work - say 10 weeks instead of 8 (on average). Whilst there is some (very limited) literature evidence that the risks of post operative complications are slightly higher in those over 80 years of age, this does not seem to be born out by our extensive experience with this procedure. Indeed, the risk of problems and complications now seems to be similar for one knee or two, and it is certainly less than having two separate replacement procedures. For many who have significant arthritis of both knees therefore, simultaneous, bilateral, knee replacement would seem to be the option of choice.

Why a simultaneous bilateral TKR

Essentially, this comes down to the question of one procedure or two. In the end, this becomes a personal decision and each individual will have separate views and reasons that come into play. What we do know however, is that knee replacement is not an easy procedure to get over: and hence, most will not come back to have the other side done under 12 - 18 months, and some will never come back.

Bilateral surgery gets this over and done with in a single stage. One time off work or out of your retirement life, one hospital stay, one recovery period and so on. It is also financially better, both in terms of the procedure itself and in relation to any loss of earnings from time off work.

What about the outcome?

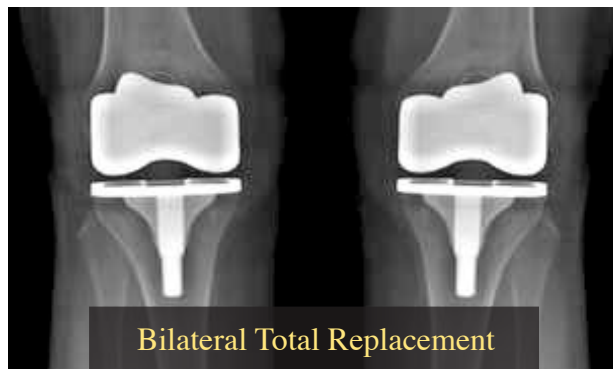
When outcomes are compared, there seems to be very little difference between having just one knee replaced and having both done together. If anything, there is a slight benefit to having both done together in that the range of motion achieved seems to be slightly better than for single knee surgery. This difference however, may be statistically insignificant.

The advantage of having both done together however is that, by 3 months, when one would expect you to be able to walk 1 - 2 kilometres per day and do gentle exercise, you should not be held back by the other knee.

The other consideration comes when looking at the deformity that has to be corrected to get the knees straight (not bow legged or knock kneed - i.e. varus or valgus), and to get them fully extending (straightening so that you do not walk around with a bent knee). If the deformity is large, and particularly if you cannot straighten the knee when standing and walking, then that necessarily makes the leg a little bit shorter. If both legs are like that, and then only one knee is replaced, then the inability to straighten the other knee will make it very hard to straighten the replaced knee. Essentially, walking with one bent and one straight knee, is like walking with one leg longer than the other. Try this with 2 - 3 cm of raise on one shoe. It is like walking over little rises all the time - up, down, up, down etc. It is hard, so most people will end up not fully straightening the replaced knee. Instead, they will walk with it slightly bent to accommodate the other leg.



Advanced Bilateral Osteoarthritis



Bilateral Total Replacement

Ultimately, this will go on to give a flexion contracture whereby the replaced knee may never fully straighten. This is a very difficult problem to fix, so if and when the other knee is replaced, it will face the same problem of a short leg on the opposite side. The end result is two matching knees that won't straighten fully. This makes walking much harder, and the knees may also be more painful when walking due to the increased load that is then placed onto the patello-femoral joint. A disappointing outcome for all concerned.

What about the anaesthetic time?

Today's anaesthetics, in the hands of a good anaesthetist, are safe and reliable. To go from a 1 hour procedure to a 2 hour one is not significantly different. Importantly, it is almost certainly safer to have one slightly longer anaesthetic than it is to have two separate anaesthetics with two recovery periods. The reason for this is that the anaesthetic itself, as well as the post-operative period during which a moderate amount of analgesia is required, combine to produce a few days during which there can be problems with confusion, fevers, chest problems, and disturbances in any underlying blood pressure or cardiac problems. It is these problems, rather than those directly related to the anaesthetic, that are the cause for concern; particularly in the elderly. For that reason, it is better that this only occurs once rather than twice.

What about the pain?

Although one may imagine that the pain experienced by having both knees replaced will be greater than that experienced by having only one knee replaced, the truth is that it is the same amount of analgesia that's required whether or not one or both knees are done at the same time. This means that the problems created by the analgesia, including confusion, sedation, constipation, and other adverse reactions, are not made worse in the setting of a bilateral knee replacement.

Similarly, the length of time for which the analgesia will be used post surgery is almost identical, independent of whether one or both knees are replaced.

What about getting around?

There is always a concern expressed by patients about the possibility of not being able to cope if both knees are done together. This is especially the case for those who live alone. Experience has shown however that patients cope extremely well after bilateral knee replacement, and indeed it is not significantly different to coping with a single knee replacement. The replacements are solidly cemented in at the time of surgery, and hence, can be stood on immediately; thus facilitating mobility. Of course it's a little bit harder in the first few days, but the average length of stay for a bilateral knee replacement is only one day longer than for a single knee replacement.

In addition, it is to be noted that by the end of the hospital stay, it is possible to climb stairs and walk far enough to get around the home; to get to the toilet and back, and to get to the fridge and back. In neither instance is it possible to drive in the first six weeks because of legal restrictions, so going out to do shopping is not possible in either case. Despite this, it is certainly possible to be driven down to the coffee shop, or to a restaurant, after a couple of weeks.

How long will I need crutches?

Most people with you will use crutches for 2 to 3 weeks, but they are merely a guide to balance rather than essential. Accordingly, there is a wide variation in terms of how long crutches will be used for: and it doesn't seem to be all that different between having a single knee replaced and a bilateral replacement. Given that some people, particularly the elderly and those who have some difficulty walking because of weakness or balance problems, may need crutches for 6 to 8 weeks, it is a little bit difficult to predict exactly how long an individual may require these. With that in mind, it is recommended that crutches are purchased rather than hired. At the end of the period of use they can then be sold, and this is generally a preferred option rather than just hiring them for a period of time that may be difficult to estimate.

What is the soonest that I can get home?

We have now had several people go home on day three following bilateral knee replacement, and certainly it is becoming increasingly common for people to go home by day four or five. One of the factors that seems to be significant in terms of the ability to get home early, is performing the procedure either without the use of a tourniquet, or with very limited use of a tourniquet. What has given us the ability to do this is the now widespread use of tranexamic acid which is given both intravenously as well as into the joint at the end of the procedure. Although this does not decrease the amount of fresh bleeding, it does stop the clot from being dissolved: and hence prevents significant ongoing bleeding.

In addition to the above, we also have access to radio-frequency devices that can be used to cauterise the tissue to an extent that doesn't seem to damage the tissue but does significantly decrease the bleeding. For the time being these devices are on trial, however, our early experience with these is promising.

The third reason that we are able to get people home early following this sort of surgery, is that we have changed the way that these joints are put in. In particular, we no longer try and make everybody's leg absolutely straight, but rather, we try and balance the ligaments so that they don't have to be released too often, and so that they are not excessively tight in any position of the knee - be that full extension through to full flexion.

What if I need to stay in hospital longer?

Health funds will not continue to pay for a patient to be in hospital longer than a certain period of time which, for a single knee is about five days, and for a bilateral knee is about seven days. The hospitals are given an up-front payment to manage a given procedure, and any extra time spent in hospital after that period is done so at the hospital's expense - and not that of the health fund.

In order to stay in hospital longer, a patient has to be transferred from the care of the Orthopaedic Surgeon to the care of a Physician. For this to happen, the Physician (usually a Geriatrician) has to review the patient and consider that there are medical grounds for continued care in an A class hospital. These must be medical grounds and not social grounds so, if you are relatively young and reasonably fit, it may be that you will not meet the criteria to go to the Rehabilitation Ward. With that in mind, it is very important that your home situation is sorted out prior to coming in for surgery. You will not need full-time care, but you will need to be contacted at least once a day, either by having a friend visit, or by having a friend or relative talk to you on the phone. You will also need to establish a relationship with that friend or relative such that they will help you obtain food and medication as required. More details in this regard can be found on Dr Holt's website in the document entitled 'Total Knee Replacement - The Journey'.

What does the evidence show?

Unfortunately, the evidence within the literature is scant. There are certainly no large studies available where the knees have been aligned without the use of intra-medullary rods, nor where the procedure has been done a large number of times by an experienced team. There are however some limited studies, of which, one of the best comes from Dr Mervyn Cross's group in Sydney. This group published a series by a very experienced Orthopaedic Surgeon who, at the end of his career, recognised that about one person in three requiring a knee replacement actually required both to be replaced.

In that series, the results of the replacement, and the morbidity of the procedure, was virtually identical in those undergoing single knee replacement versus those undergoing bilateral replacement. Indeed the only difference was in the over 80 year old group, where the complications seemed to be slightly higher. There were however, factors involved that may relate to the use of intra-medullary rods to establish the alignment of the knee, and it is known that there is significantly less morbidity when this is not done. Our current experience therefore, in a centre where computer navigation is used rather than intra-medullary rods, is that even in that age group there may be no significant difference in morbidity or mortality. Hence, even in that age group, it may be safer to do both knees

together rather than having to come back and do a second procedure, with a second operation, a year or so further down the line.

A 2013 study published in the *Journal of bone and joint surgery (JBJS)* concluded that bilateral surgery is more cost-effective, with better outcomes for the average patient, than staged procedures. Some more recent studies have found slightly increased rates of DVT and pulmonary embolism in bilateral knee surgery, but our experience with this, using our techniques, would suggest that that is probably not the case.

Similarly, there may be a slightly increased need for blood transfusions but, the use of tranexamic acid and other measures, have shown that the transfusion rate is under 1% even in bilateral replacement: and it can be reduced still further with the use of preoperative iron infusion in those that require it.

In recent times where we have been performing the surgery without excessive use of, or completely without the use of, a tourniquet, we have been looking at this aspect. To date, we have not found the blood loss to be any greater when the tourniquet is not used. It is however, too early to know whether this will remain the case when we look back on several hundred such procedures.

Should I consider having a bilateral TKRs?

In the end, this becomes a personal decision. The current evidence from a large series at our institution would suggest that the risks of bilateral total knee replacement are identical, or at best only marginally different, from having a single knee replaced. The time in hospital is only marginally different. The amount of analgesia required is identical, and the morbidity of the two procedures seem to be just about equivalent.

Some people cannot contemplate the thought of having both their knees replaced at the same time whilst others cannot contemplate having to come back and have the same procedure done a year or so later. Whilst we recommend bilateral knee replacement for those with significant problems in both knees, we understand that this is not for everyone, even if it is the option that the vast majority choose. In the end it is your choice and not our choice, so ultimately it is decision that you have to make and be happy with.

Further information can also be obtained on this and other related topics, such as:

Knee replacement, the journey
Pain management after knee replacement
Rehabilitation after knee replacement
Knee replacement after discharge

at: www.keithholt.com.au