

Trends in Total Knee Arthroplasty in a Developing Region: A Survey of Latin American Orthopaedic Surgeons

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Abstract

Introduction: A number of different total knee arthroplasty techniques are available. There is also a degree of surgeon preference for these, and the variation across orthopaedic surgeons in Latin America is currently unknown.

Methods: A survey on members of Sociedad Latinoamericana de Artroscopia, Rodilla y Deporte was performed, with questions based on categories within worldwide national joint registries. In total, 315 Sociedad Latinoamericana de Artroscopia, Rodilla y Deporte members received the survey via e-mail, and the return answers were compared with the latest worldwide national joint registry annual reports.

Results: The survey was completed in full by 262 surgeons (83%). It was answered that 19% of surgeons perform less than 10 total knee arthroplasties per year, 54% perform less than 30, and only 9% perform more than 100. Seventy-three percent of surgeons use a posterior stabilized total knee replacement, 18% use a cruciate retaining total knee replacement, and 9% use a medial pivot design. Forty-nine percent of surgeons resurface the patella, 27% never resurface it, and 24% choose to resurface it based on an individual case scenario. Ninety-eight percent of surgeons use cemented fixation in the femur and tibia, with the remaining 2% choosing hybrid fixation and 1% using fully noncemented fixation.

Conclusion: This survey among Latin American surgeons has demonstrated important differences in surgical technique and implants choice compared with worldwide national registries.

Latin America is a vast and developing region, with great inequality both within countries and between them. No national joint registries are present in the continent, making it almost impossible to know the trends and strategies that Latin American surgeons are adopting across a wide range of knee procedures. Sociedad Latinoamericana de Artroscopia, Rodilla y Deporte

(SLARD) is the main knee surgery society in the continent, and with more than 1,000 members and many more regular attendants interested in their activities, it is an important source of information. SLARD is responsible for developing and educating knee surgery around the entire region.¹

A number of different total knee arthroplasty (TKA) techniques exist,

and a variety of different implants is available. There is also a degree of surgeon preference, and this potential variation across orthopaedic surgeons in Latin America is currently unknown. It is important to monitor the current usage and preferences and compare them with the rest of the world, and without national registries to annually monitor the changes, it requires members of organizations like SLARD to communicate effectively and gather this information.

Methods

A survey of the members of SLARD was performed, with questions based on categories within worldwide national joint registries, focusing on TKA. Members of the SLARD with a specialist interest in knee surgery were selected and e-mails taken from the SLARD database. In total, 315 members received the survey via e-mail, with a further maximum of three attempts to ensure an optimal reply rate. The full questionnaire with both questions and possible answers can be reviewed in the Appendix, Supplemental Digital Content 1, <http://links.lww.com/JAAOS/A414>.

All return answers were tabulated and the results compared with the latest national joint registry annual reports from Australia (Australian Orthopaedic Association National Joint Replacement Registry [AOANJRR]),² New Zealand (The New Zealand Joint Registry)³, United Kingdom (UK National Joint Registry [NJR])⁴, Sweden (Swedish Knee Arthroplasty Register)⁵, Norway (The Norwegian Arthroplasty Register)⁶ and the United States (American Joint Replacement Registry [AJRR])⁷ This allowed a direct comparison with techniques, trends, and implant types across the world.

Results

The survey was answered completely by 262 surgeons (83%). Regarding surgical volume, 19% of the surgeons answered that they perform less than 10 TKAs/year, 54% performing less than 30 TKAs/year, and only 9% performing more than 100 TKAs/year. Regarding the stabilization method used (Figure 1), 73% of the surgeons use a posterior stabilized (PS) total knee replacement, 18% use a cruciate retaining (CR) total knee replacement, and 9% use a medial pivot design. Regarding patellar resurfacing (Figure 2), 49% of the surgeons resurface the patella, 27% never resurface it, and 24% choose to resurface it based on an individual case scenario. Regarding fixation method (Figure 3), 98% of the surgeons use cemented fixation in femur and tibia, with the remaining 2% choosing hybrid fixation and 1% using fully noncemented fixation. Regarding the use of computer-assisted surgery (CAS) (Figure 4), 95% do not routinely use it. Of the remaining 5%, 4% use navigation and 1% robotic guidance.

The use of thrombosis prophylaxis varied; 44% report using low-molecular-weight heparin (LMWH), 35% using a factor Xa inhibitor drug, 14% using a thrombin inhibitor drug, 5% using aspirin, and 2% using other unspecified drugs.

Tourniquet use is common between the surgeons surveyed, with 66% of them using it during the whole procedure and 12% inflating for cementation only. Tranexamic acid in any form was in use by 60% of the surgeons.

Discussion

The results of this detailed survey have covered the key factors in TKA recorded in the national joint registries. It has gained an understanding

of the technique and implant choice from a broad distribution of knee surgeons from across Latin America. The responses have some important similarities and differences when compared with the national registries of other countries. The New Zealand registry shows that 17% of the surgeons operate less than 10 TKAs/year, with 33% operating more than 40 TKAs/year. The UK NJR shows that 34% of the surgeons operate less than 25 TKAs/year and 12% operate more than 100 TKAs/year. In comparison, our region has a lower volume of TKAs per surgeon, with more than half of the surgeons surveyed performing less than 30 TKAs/year and less than 10% doing more than 100 TKAs/year. Explanations for this could be related to a lack of resources compared with the countries reviewed⁸ or that there is a difference culturally and in patient education, with a degree of apprehension and low expectation due to the rate of dissatisfaction after TKA.⁹ As an example, with worldwide rates of total hip arthroplasty similar to TKA, in our region, total hip arthroplasty with its better-perceived outcome still significantly outnumbers TKA.¹⁰

There remains debate regarding the optimal stabilization method; however, the differences between our survey and the national registries are significant. The clear preference in the region is PS with a rate of 73%. By contrast, the AOANJRR shows a 68% usage of CR components, with PS representing 26% and medial pivot 6%. In the New Zealand registry, the values are expressed in graphics, but more than 70% of the cases are CR, with the remainder PS. The UK NJR reports a 72% usage of CR components and a 25% usage of PS component, and the Norwegian registry follows the same trend, with a 67% use of CR components and an 8% use of PS component.

Interestingly, in this registry, rotating platforms appear as the second most used design with a 25% rate. The Swedish registry has the most extreme difference, with CR implants being used in 91% of the cases and the rest PS implants. Only the AJRR comes close to the regions use with a 53% rate, with the potential for this to be evidence of a geographic influence.

Patellar resurfacing is a subject of debate among surgeons worldwide.¹¹ In the United States, the rates of resurfacing are between 91.2% and 94.2% of the cases in the last 5 years according to the AJRR. Following a similar but less extreme trend, the AOANJRR shows a 64% rate of patellar resurfacing. Contrarily, the New Zealand registry shows a 35% rate of patellar resurfacing. More extreme differences are seen in the Norwegian and Swedish registries, with only a 4% and 2% rate of patellar resurfacing, respectively. Our survey is in the middle range, with almost 50% of the surgeons resurfacing in every case. This is an area where strong geographic opinions exist, and as there is no strong evidence for or against patellar resurfacing,¹² the decision seems to be currently based on personal preferences and surgical training rather than clinical outcomes.

Cementation is proven to be effective and reliable in TKA.^{13,14} However, some recent studies have demonstrated that hybrid fixation and non-cemented implants can perform equally as well.^{15,16} Following this newer trend, the AOANJRR shows a 66% rate of full cementation, a 22% rate of hybrid fixation, and a 12% rate of noncemented fixation. The New Zealand registry reports that more than 95% of TKAs remain fully cemented. The UK NJR reports a 94% rate of full cementation, a 5% rate of noncemented implants, and a 1% rate of hybrid technique. The

Figure 1

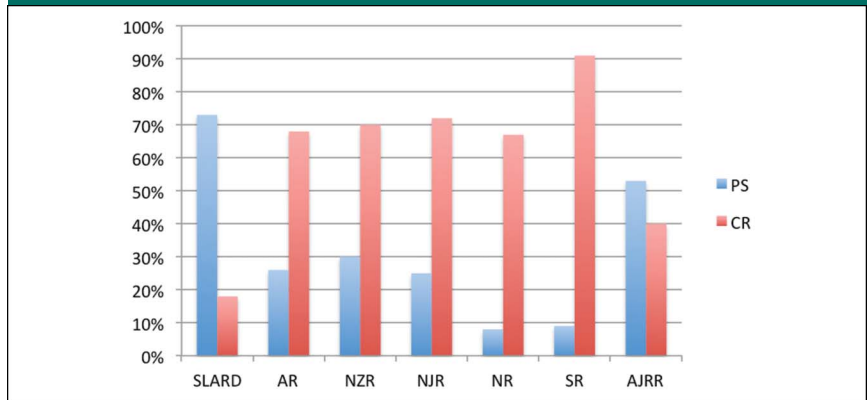


Chart showing the stabilization method. AR = Australian Registry, AJRR = American Joint Replacement Registry, CR = cruciate retaining, NJR = National Joint Registry (UK), NR = Norwegian Registry, NZR = New Zealand Registry, PS = posterior stabilized, SR = Swedish Registry

Figure 2

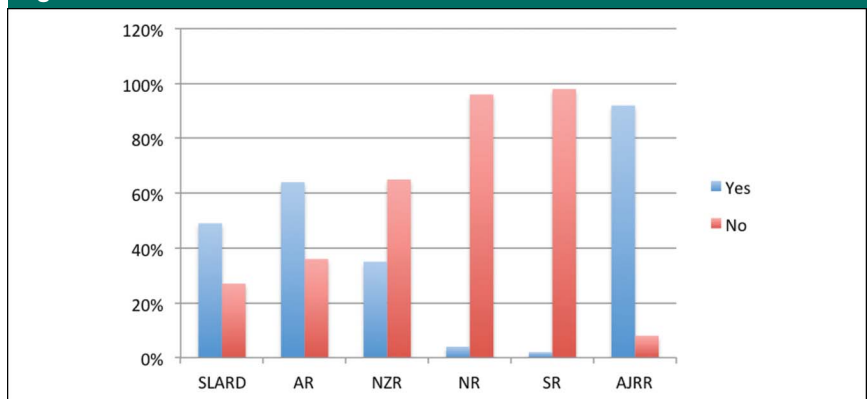


Chart showing patellar resurfacing. AR = Australian Registry, AJRR = American Joint Replacement Registry, NR = Norwegian Registry, NZR = New Zealand Registry, SR = Swedish Registry

Norwegian registry reports that approximately 70% of TKAs are fully cemented, with approximately 18% using hybrid fixation and 12% non-cemented. The Swedish registry shows a 90% rate of full cementation, a 1% rate of hybrid technique, and a 9% rate of noncemented components. The rates of cementation in our survey are among the highest compared with those in other registries. The explanation could be that Latin American surgeons choose not to change the technique until firm evidence

from long-term results have been demonstrated.

The use of computer guidance for TKA has been demonstrated to give better objective alignment than manual instruments,¹⁷ but this has not made an impact on routine regional practice. The technology is new and evolving, and its use is still not widespread, with different trends among registries. The Australian registry shows a 31% rate of CAS usage, and the New Zealand registry shows an 11% of usage, reflecting an early uptake of new

Figure 3

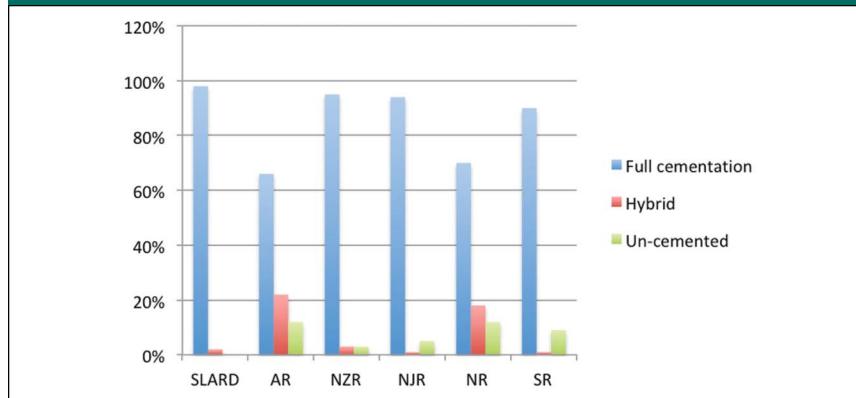


Chart showing the fixation method. AR = Australian Registry, NJR = National Joint Registry (UK), NR = Norwegian Registry, NZR = New Zealand Registry, SR = Swedish Registry

Figure 4

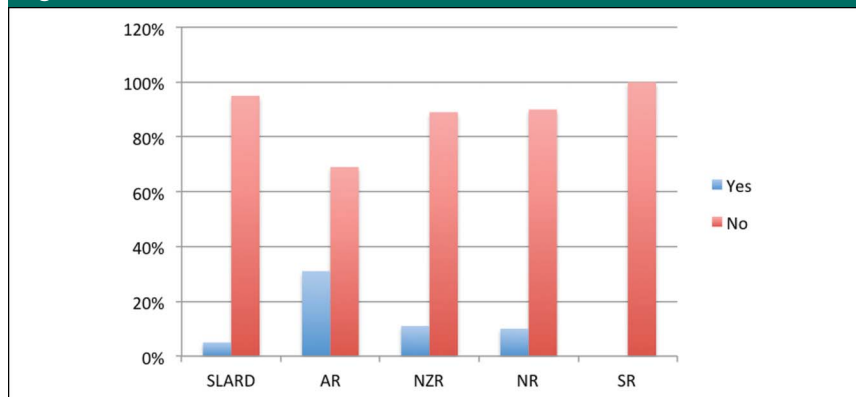


Chart showing computer-assisted surgery. AR = Australian Registry, NR = Norwegian Registry, NZR = New Zealand Registry, SR = Swedish Registry

technology in this region. The Norwegian registry shows a 10% CAS usage, but CAS is rare in the Swedish registry, with only 0.1% of the cases reporting usage. Some variation in clinical outcomes remains¹⁸ despite recent articles demonstrating some beneficial outcomes in younger patients.^{19,20} The economic impact of CAS has been important in the adoption rates and could be a significant factor in a continent with areas not rich in economic resources. It is likely that long-term studies supporting the usefulness of CAS surgery in TKA would be required

before the usage rates in our continent starts to increase.

Chemical thromboprophylaxis is still a subject of debate, and there is a broad worldwide variation.²¹ Our survey shows that new oral drugs are accounting for almost 50% of the prophylaxis in the region. Contrarily, the Norwegian registry reports that 81% of the TKAs had prophylaxis with LMWH, whereas all other options report a 1% or less of usage, except the combination of two drugs which accounted for 14% of the cases. The Swedish registry also reports an 80% use of LMWH with no

data added on other drugs. An American Academy of Orthopaedic Surgeons guideline from 2011²² recommends the use of pharmacologic agents to prevent thromboembolic events during TKA surgery, but it states that not enough evidence is present to recommend any specific agent. Without a conclusive recommendation, the easier oral prescription for the patient (no injections) may be the reason for the penetration of those new oral drugs in our regional markets.

Tourniquet use is widespread among Latin American surgeons, as we are highly influenced by the United States, where a 2010 survey shows that there was nearly 100% use of tourniquet in TKA between members of the American Association of Hip and Knee Surgeons.²³ By contrast, the Swedish registry reports a lower rate of tourniquet use during TKA (55%).

Tranexamic acid has been one of the more important additions to TKA surgery in the recent years.²⁴ However, the usage rate in our region is still small compared with that in other countries, which may also explain high tourniquet usage. The Norwegian registry shows that tranexamic acid is used in 100% of cases. The reason for this low regional volume use could be the availability, with some countries and some hospitals having no access to this drug, or if available, only in its intravenous form. With strong evidence for a reduction in both blood loss and transfusion rates,²⁴ this is an area that should be addressed.

Conclusion

This survey among Latin American surgeons has demonstrated important differences in surgical technique and implants choice compared with worldwide national registries. It is vital that as a rapidly developing

region, an evidence-based approach is adopted and a regular comparison review of worldwide trends is performed. The findings of this survey strongly advocate for a more robust data collection process and the formation of a regional Joint Replacement Registry.

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