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Chapter 20

Extensor Mechanism Complications After Patellar Resurfacing in Knee Replacement – Can They Justify Non-Patellar Resurfacing?

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Additional information is available at the end of the chapter

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1. Introduction

Patellar resurfacing is still nowadays a controversial matter in articles, cross fires and meetings. We know that this is not a new subject as the issue of whether or not to resurface the patella when performing a TKA has been a debatable topic for more than two decades [1]. We can find three philosophies around what to do with the patella in TKA and there is still no best conclusion about benefits from one or another procedure.

Many randomised trials provide inconclusive evidence in relation to resurface or not the patella after TKA and these trials fail mainly because short sample sizes. Some meta-analysis have been reported last years in order to clarify this issue and though no great differences have been found between both procedures, patellar resurfacing shows better functional results and less anterior knee pain [2-4]. Nevertheless, what is cleared stated in literature is that treatment of the patellofemoral joint in knee replacement and its ultimate results are multifactorial.

Surgeons around the world can be classified into three groups according to their preference in the topic of resurfacing or not the patella: universal resurfacers, non-resurfacers and selective resurfacers. One of the reasons that non-resurfacers use as justification for their performance is that patellar resurfacing implies complications related to extensor mechanism of the knee. Moreover complications related to extensor mechanism are a common basis for

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TKA revisions and these problems have less favourable outcome than patients who undergo revision for other reasons.

The use of computer-aid navigation systems in knee replacement have allowed to accurate some of the mistakes in coronal, sagittal and axial alignment of femoral and tibial implant that are related to patellar maltracking. In the near future it should be possible to navigate the patellofemoral joint, so problems linked to this compartment will diminish. Until now, there is a report of a surgical navigation system that let to assess intraoperatively patellar tracking, one of the main reasons of TKAs' failure, with the aid of a computer. The system is quite complex and it is not available for all the knee prosthesis designs. However, the method could be a valuable support to analyze patellar tracking at the time of the surgery and a real help to decide whether or not patellar replacement [5].

In this study we have reviewed our extensor mechanism complications relate to knee replacement for the last 6 years in order to analyze if they have a high rate that could justify non-patellar resurfacing. We believe that a careful and meticulous technique during patellar resurfacing can avoid most of the problems found after knee replacement. It is not reasonable that in these days in which many surgeons are worried about accurate alignment of knee components and most of them use computer-aid navigation systems to be more precise in prosthesis placement we are not as careful as in other steps of the procedure when resurfacing the patella.

2. Material and method

We have retrospectively revised all the TKA's performed in our Institution from January 2005 until December 2011. For this period of time, the two fellowship-trained surgeons (AS and FA) performed 860 TKA using a standard technique for knee replacement and similar rehabilitation protocol. Postero-stabilized cemented total knee arthroplasties were used in all cases (Performance® Biomet Warsaw, IN and Vanguard® Biomet Warsaw, IN). Patella was resurfaced in all cases according to the philosophy of our Department. Demographic data are shown in table I.

A single dose of intravenous antibiotic (cefazolin 2 gr or vancomycin 1gr in allergic patients according to the protocol of our Hospital Infection Control Committee) was given ½ hour before incision. After general o regional anaesthesia depending on patient and physician's preference, tourniquet was routinely applied as proximal as possible in the thigh. Longitudinal incision along the knee and medial para-patellar arthrotomy were performed to gain access to the joint. Surgery was performed according to the standard procedure and femur and tibial implants were cemented to the bone. Careful alignment of both components was checked before implantation. Posterior-condyle plus 3° of external rotation and trans-epicondylar axis were used without distinction to get an adequate femoral rotation. On the other hand tibial component was aligned to the medial third of the tibial tubercle. We don't usually evert the patella during this time of the procedure. Once femoral and tibial trials were in place, we arrange for the patellar resurfacing step.

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Sex	**Female: 536/ Male: 324**
Side	Right: 492/ Left: 368
Age (years)	73.15±6.06
BMI (kg/m^2)	27.76±3.12
Previous surgery (%)	38.3%
Radiological valgus (%)	9.7%
Pre-operative diagnoses	
Osteoarthritis	593
Osteonecrosis medial condyle	137
Metabolic arthritis	78
RA	35
Fracture sequela	17

Table 1. Demographic data and preoperative parameters

In our experience it is crucial to be as thorough as possible in patellar resurfacing step to achieve good results and avoid extensor mechanism complications. Most of these problems should be avoid with a more methodical procedure. We employ the instruments provide by the manufacturer to afford patellar resurfacing though we accept they are not always useful. However, more precise instruments in recent systems allow more accuracy placing the patella. The Vanguard System Knee® provides specifically devices (cutting guide) to improve the results. It offers a calliper or vernier to estimate patella thickness before and after the cut, a guide with a magnetize gauge to determine the deep of the cut after guide positioning and it is possible to choose single or three-peg configuration at the time of the surgery. Devices availability in theatre make the surgeons more self-assured when dealing with patello-femoral joint. Albeit these devices can't be employed in 100% of cases as patellar morphology, size or wear difficult its use. The fact that surgical instrumental can't be employed, doesn't mean patellar resurfacing is a trivial step in knee surgery.

For this series we have used all-polyethylene patellar component design with single or three-peg configuration. The prostheses employed in our cases just provide onlay patellar implants. We usually make peripheral electrocautery around the patella and remove soft-tissue synovium in the upper part of the patella to avoid patellar clunk syndrome as we perform posterior stabilized designs.

Patients received intravenous antibiotics (cefazolin 1g/8h) for 48 h after surgery according to the protocol of our Institution. Post-operative bandage was removed at the second day after surgery to check incision and vascular condition of the leg. Output drainage was removed 36-48 h after surgery. They started physiotherapy of the operated knee the second day after surgery when drains were removed if proper laboratory values were obtained. Full weight bearing on the operated limb was allowed immediately except in those cases the surgeon contraindicated the pre-established protocol because of surgical difficulties. Physiothera-

pists instructed the patients to walk either with walker or crutches depending on their ability. They go up stairs with the help of the banister the fourth-fifth day after surgery before leaving the Hospital.

Prophylactic low molecular weight heparin (enoxaparin) was used for the next 28 days after surgery. Patients stay at our Institution depends on his/her ability to keep up with daily activities (range 4-8 days), obviously after their haematological values were as best as possible.

Outpatient follow-up was done at 6, 12 weeks and the annually for clinical and radiological evaluation of the operated knee. We assessed clinical evaluation including gait, need for assistance devices, ROM, joint stability, knee score (KSS) and visual analog scale (VAS). Routine A-P and lateral views were done to evaluate mechanical axis and proper alignment of the implant. In those cases with extensor mechanism complications axial views and other techniques such as US, CT or MR were used to analyze the problem.

Intra-operative and post-operative complications were captured and collected for descriptive study. Arthroscopic technique was indicated in case internal injuries of the knee (patellar clunk syndrome); on the other hand open surgery was used for management of instabilities, tendon ruptures, patellar fracture…

3. Results

There were 860 primary total knee arthroplasties performed with the use of the "Performance System" (Biomet®, Warsaw, IN) and the "Vanguard System" (Biomet®, Warsaw, IN) in this series, done through a longitudinal incision with medial para-patellar arthrotomy. Underlying diagnosis was osteoarthritis and osteonecrosis of the medial condyle in more than 80% of cases. Mean follow-up was 48 months (ranging from 6 to 78 months).

Thirteen patients (1.51%) showed wound infection and developed an acute infection and eleven cases (1.27%) suffered haematogenous infection more than a year after surgery so these patients were excluded from this series as they required revision surgery (836 patients were included in this series). Co-morbidities in these patients were diabetes mellitus, rheumatoid arthritis and obesity. During follow-up elevated ESR (>20) and CRP (>5) values and clinical signs of infection were detected. Aspiration culture was positive 19 cases (79.16%) and the most frequent microorganisms identified were staphylococcus spp, meticillin-resistant staphylococcus aureus, streptococcus spp and pseudomona aeuruginosa.

In our series required time to walk by a walker or two crutches was 2.25±1.45 days and patients were able to go up and down stairs with the help of the banister at 5.03±2.67 days (range 4-15 days). More than sixty percent of patients were capable to walk without the help of any assistive aids at four weeks postoperatively. However, we advise the use of at least one cane for the first six weeks after the operation, to avoid stumbling as many patients in this series are elderly. Clinical results are shown in table II.

Knee Society Score improved from 53.48±6.21 (range 39-67) to 92.037± 7.23 (range 85-94) a year after surgery. Visual analog pain score after surgery improved to 1.891±0.31 in more

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than 90% of cases three months after surgical procedure. This can be judge as a satisfactory score as painful knee arthroplasty is a non-desired state after joint reconstruction.

		Preoperative	6 weeks	12 weeks	1 year
Pain (VAS)	<2 (%)	2.39	83.61	92.19	94.49
	2 to <5 (%)	35.52	13.63	5.75	3.96
	5 to <8 (%)	45.09	2.51	1.91	1.31
	>8%	17	0.24	0.24	0.24
KSS (knee score)		53.48±6.21	79.437±8.32	89.065±5.87	92.037±7.23
Average ROM		-5 /85°	0 /95°	0 / 115°	0 / 115°
Walking capability	>2 h (%)	1.91	50.35	60.04	61.96
	>1 h (%)	22	27.63	29.06	29.06
	>30' (%)	75	31.31	10.43	8.51
	Not walk (%)	1.09	0.71	0.47	0.47
Walking support	No support (%)	57.05	62.53	86.12	90.55
	1 cane or crutch (%)	42	35.81	12.58	8.27
	2 crutches (%)	0.95	0.95	0.83	0.71
Stairs	Normal (%)	63.03	77.25	85.16	85.52
	Banister (%)	35.88	21.54	14.37	14.01

Table 2. Clinical results

Mechanical axis (180º±3º) was restored in 95.04% of cases. Alignments of the femoral and tibial implants in frontal and coronal axes were measured without significant deviation from standard values.

Main extensor mechanism complications are shown in table III. The most frequent complications were instability of the extensor mechanism and patellar fractures. However, most of the fractures were related to a traumatic event as patients in this series were old people, so this complication cannot be only linked to surgical aggression. Patellar tendon rupture was mostly related to knees with previous surgery as valgus osteotomy.

Instability of the extensor mechanism (patellar dislocation or subluxation)	**1.79% (15 cases)**
Patellar fracture	1.43% (12 cases)
Patellar tendon rupture	0.47% (4 cases)
Patella loosening	0.95% (8 cases)
Clunk syndrome	0.71 (6 cases)

Table 3. Extensor mechanism complications

4. Discussion

For many years dealing with the patella in total knee arthroplasties has been a controversial topic. Most of the non-resurfacers surgeons justify their choice based in the frequent complications related to surgery around the patella. It is true that surgical gestures used during patellar resurfacing can affect the patello-femoral tracking, weak patellar bone or alter vascularisation around the patella. Besides it has been remarked by many authors that some knee replacements failures are related to disorders in the mechanics of the patellofemoral joint.

Soft-tissue imbalance is shown as the responsible of patellar instability, the most frequent extensor mechanism complication with an incidence as high as 29% in some series after TKAs [6]. Muscle atrophy, weakness, more proximal attachment of the VMO after closure of the arthrotomy and predominance of the VL are considered the main causes of patellofemoral dysfunction [6]. However, forces from the different bellies of the quadriceps can modify patellofemoral function [7].

Aside from anatomical aspects of the quadriceps that are non surgical-dependant, some technical aspects on the patellar side should be observed during this step of the surgery. It is of main importance to restore patellar thickness to prevent from high mechanical pressures and increase de risk of patellar fracture [8]. It is recommended to maintain between 13 and 15 mm of patellar bone remained to adapt the all-polyethylene insert which has 8-10 mm thickness. Surgical technique is of crucial importance in patellar alignment. An increase combined thickness of the implant and patellar bone leads to higher forces on patellar side and close follow-up of these patients should be done. Postoperative lateral tilt increased when thickness after patella resurfacing was augment in 1 mm from the preoperative patella [9]. This lateral tilt is usually treated by lateral release that improves patellar alignment, but lateral release is related to complications as patellar fracture, vascular problems and postoperative pain [10].

Patellar fracture is not an exclusive complication of resurfaced patella and can be sustained in non-resurfaced cases but in rates as low as 0.05%. They are usually related to rheumatoid arthritis or advanced degenerative osteoarthritis [11]. Only in cases of a thin patella or sclerotic bone we advise not to resurface the patella.

http://dx.doi.org/10.5772/53382

Another important fact in this patellar reconstruction is the direction of the osteotomy. Changes in resection angle influence patellar tracking and favour lateral tilt that could require a subsequent lateral release. The goal is to get a flat bone cut with a symmetrical resection. This step could be done freehand, but we employ the cutting guide provides by the manufacturer to improve our results. Once the cut has been done, medial placement of the polyethylene offers better patellar tracking than if it is placed laterally. It is advisable to assess patellar tracking with the "no-thumb" rule placing the knee through full ROM. If the patella tracks laterally, lateral release should be taken into account trying to preserve superior lateral genicular vessels in order to avoid osteonecrosis, patellar fracture or post-operative pain [8, 10].

The fixation of the implant could be done with single or three pegs system depending on surgeon's preference. Today loosening of the patella is a rare complication. As we have said our knee models have only available "onlay" patellar prosthesis, though some authors recommend "inlay" inserts which make them more confident, but no significative differences are observed between the two models [12]. It is said that "inlay" implants allow increase the interface bone-cement, preserve more bone stock and are easy to use [13], but survivorship and clinical and radiological results are similar to the "onlay" designs [14]. In our series we have employed all-polyethylene patella without important complications and good functional outcomes.

Patellar instability, which may happen after TKA with or without patellar resurfacing, is a major cause of functional restraint that requires revision surgery. The incidence of symptomatic instability leading to revision is around 0.8%, lower than instability of the extensor mechanism in our series, but we want to remark that most of our cases were classified as subluxations (8 cases out of 15), not frank dislocations so revision rate was similar. Conservative methods as quadriceps exercises, braces or avoiding activities that aggravate instability were applied in subluxations and with time scarring of the retinacular tissues lead to resolutions of the symptoms. However in cases of frank dislocation revision surgery was mandatory. In these cases careful analysis of prosthesis sources of instability were cautious checked to avoid failed surgery. If problem was related to soft tissues, realignment of the extensor mechanism should be considered (lateral release plus proximal or distal realignment) [15].

We must remember that other issues as design and placement of the implants may predispose to extensor mechanism complications. Design of the femoral sulcus generated years ago high incidence of patellofemoral complications and led to debate if patella should be resurface and how to do this replacement [16]. Modern knee prostheses have got more anatomic designs, but even now there is no consensus about the size, shape and position of the femoral trochlea in relation to femorotibial compartment [17]. Furthermore it is important to restore sulcus position (0.7 mm lateral to the midline of the distal femoral cut) during surgery as best as possible [18].

As well as properties of the femoral and patellar designs, surgical details of the technique are also valuables. Restoration of the mechanical axis is of great importance in knee surgery, as it is selecting the appropriate size of the femur to avoid overstuffing of the anterior com-

partment [19] and placing the femoral implant lateralized. Femorotibial alignment influences patellar tracking in native knees as does after knee replacement. Navigation systems that allow surgeons to be more precise in coronal and sagittal planes alignment avoid problems in patellofemoral joints [10].

In our opinion getting the proper rotation for the femoral and tibial components is the main goal to avoid complications of the extensor mechanism [19, 20]. There are four ways for determining the rotational alignment of the femur, however we have only used in this series the trans-epicondylar axis and 3° of external rotation based on the posterior condyles. Rotational alignment of the tibia is as important as femoral placement, so neutral or external rotation of the tibial component in relation to the tibia decreases the Q angle and helps patellar tracking [20, 21]. Usually more attention is paid to rotational position of the femoral component than to the tibial baseplate and the goal to get proper coverage and good cortical support for the tibial implant could led to a wrong rotational tibial alignment. External rotation of the tibial component moves the tibial tubercle internally so less patellofemoral complications are detected in this situation [22]. Precise rotational tibial alignment can be obtained from a line perpendicular to the epicondylar axis of the femur [22].

Significance of implant position is crucial in order to avoid extensor mechanism problems, so navigation or personal guides system should offer some advantages at the time of prostheses placement. However many authors believe that proper accuracy can be obtain with traditional guides. X-ray allow to evaluate alignment of the components in the coronal and sagittal plane as well as patellar tracking in the axial view, but rotational position of the implants can't be assess by simple radiographies. In these cases we must employ CT to get a more precise image of the situation of the components that can justify extensor mechanism complications.

It is important to remark the importance of being careful with this resurfacing step as we are with the other ones. It’s surprising as some surgeons are extremely cautious with bone cuts, implant alignment and gaps balancing, but not so watchful with patellar resurfacing. After patella evertion they made a non-controlled cut and leave the PE component on it, without taking into account cut direction, bone width or thickness and medialization of the PE implant.

Preoperative patellar tracking can be a measurement of great value in order to analyze patellar position after TKA. Lateral displacement of 3 mm is predictive of patellar maltracking when the knee is placed in full ROM after surgery. This is an evidence of the issue that patellar tracking is related to soft-tissue tension [23]. Lateral shift of the patella implies a contracture of the lateral tissues and this event can be detected in standard preoperative radiographic images. This can be help to identify patients at a higher likehood of experiencing maltracking after TKA [23]. Of course a valgus knee deformity is related to problems with patellar tracking, but a more careful analysis of the preoperative X-ray may help us in patellar replacement decision.

Resurfacing the patella by all-polyethylene implant can be questioned as this surgical gesture obviously affects patellar tracking, but on the other hand non-resurfacing the patella

suppose a different pattern of contact at the patellofemoral joint. To assess intraoperatively patellar tracking a surgical navigation system with the aid of a computer have been designed but until now it is not routinely used. However, the system could be a valuable support to analyze one of the main reasons of failure in TKAs [5].

Until recent days it couldn't have been established a correlation between anterior knee pain and weight [24]. However there is some evidence of a relationship between knee pain and patella tilt. [25]. So "inlay" implants have been criticized for leaving a portion of the lateral facet uncovered by the implant that could be considered a source of pain as it articulates with the femoral component. This liaison may be linked to increase anterior knee pain or worse Knee Society Score. Though we have checked few problems with "onlay" insert in our series, some authors prefer the inset technique of patella resurfacing which for them is simple and safe [1]. We have no experience with the inset patella design proposed by Freeman in 1989 and improved over the years. It looks as this design would have less patellar tracking problems, would need less lateral releases and show less signs of instability in the axial X-rays. On the other hand the technique is more demanding and sacrifices more bone, but allow us to be more precise in restoring patellar thickness [1].

Many extensor mechanism complications can be evaluated through simple X-ray (patellofemoral instability, patellar fracture, loosening of the patellar insert, complete patellar o quadricipital tendon rupture...). US images and IRM help us in diagnosis of partial ruptures of the extensor mechanism, synovial effusions... and TC is of great aid in analyzing rotational position of the components. But what can we do in front of a painful total knee arthroplasty without positive results in conventional diagnostic techniques. The easiest decision is to resurface the patella in case it wasn't but if it was? Careful analysis of the different diagnostic tools is essential (X-ray, evaluation of patellar tracking, CT imaging to check components rotation...). Recently SPECT/CT imaging looks very helpful in establishing the diagnosis of painful knees after TKA, mainly when we are in front of patellofemoral problems without components malposition or loosening. A significantly higher tracer uptake in the patella is shown with this SPECT/CT technique in patients with painful knee due to patellofemoral problems [26].

Patella resurfacing is related to good clinical results but is also linked to some extensor mechanism complications and a possible need for revision surgery in the future [25]. On the other hand, non-resurfacing could avoid complications of the extensor mechanism but a high rate of anterior knee pain is perceived. This situation drives the surgeon to a predictable reoperation as patients increase their retrieval of pain relief. For this reason we consider the decision to resurface the patella as a subjective question [25]. Current literature on patellar resurfacing after TKA has not shown a clear advantage of patellar resurfacing if we analyzed clinical scores, though for many authors patellar replacement looks a better strategy in order to avoid reoperation and anterior knee pain. As the average reoperation rate for non-resurfaced cases was 7.2% compared to 2.8% for the resurfaced, resurfacing the patella would prevent one revision surgery for every 23 patella resurfaced. Knowing the cost of a revision surgery and taking into account that less than 50% of patients would benefit from a

secondary resurfacing, primary replacement of the patella offers economic and clinical advantages [25].

The Swedish Knee Arthroplasty Registry shows statistically significant patient satisfaction in cases of patella resurfacing in 98% of about 27000 knees follow-up at 14 years. The Registry also shows that there is 1.27 risk ratio for unresurfaced patella to be revised. The Australian National Joint Registry reveals the same risk ratio (1.25). We must be careful with these numbers about unresurfaced patella being revised because our first option in front of a patient with anterior knee pain an unresurfaced patella is to resurface it. However, more than 50% of patients are dissatisfied with revision for only patella component [27, 28]. What looks evident from the different meta-analysis is that anterior knee pain is greater after non-resurfacing the patella, as well as patient dissatisfaction and increase revision rate. It looks positive resurfacing the patella at primary surgery based on functional results [27]. Some authors do not agree with this assertion and after an observational study from the Norwegian Arthroplasty Register they conclude that patella resurfacing has no clinical effect on function or anterior knee pain, which is debatable [29]. The Norwegian Register finds a lower risk of revision when the patella is resurfaced after a TKA although differences in rates of revision surgery are not significant. But improvement in new prosthesis designs that have substituted the older ones has been related to an increase in the survivorship of the knee prosthesis in Norway [30].

In a prospective cohort study that compares resurfaced vs. non-resurfaced patella in 65 patients that received bilateral total knee replacement, significant better scores were achieved on the resurfaced side at final follow-up. Anterior knee pain was a complaint in 4 patients on the non-resurfaced side and revision surgery was required in these patients. On the other hand no revision was performed in the resurfaced side. The author concluded that better patellofemoral functional outcomes, less anterior knee pain and lower rates of revision surgery could be obtained after patella resurfacing [31].

Nowadays, it looks as two great groups of surgeons are completely established and divided by a huge lake: the North American resurfacers and the European non-resurfacers, however it is not possible to reach a conclusion about which alternative is better. But we can add another group whose select when to resurface the patella. Which are their criteria? How can they determine which patients would need or not patellar resurfacing? The quality of the cartilage and joint congruence can be parameters that aid in the determination of selective patellar resurfacing [32, 33]. When could we advise not to resurface the patella? Park et al remark that non-resurfaced patella is possible if the patient is a young one, the patella is small and its cartilage is almost normal, the patient has no preoperative anterior pain and bone quality is good [34]. If some surgeon decides not to resurface the patella it looks advisable to remove osteophytes of the patella and carry a marginal electrocauterization. Selective resurfacing of patellar bone with specific criteria and the used a patella-friendly implant can be associated with satisfactory outcomes [34].

Reasons for resurfacing the patella are avoiding anterior knee pain, so reoperation rate can be reduced, improve results in some patients with RA and improve functional outcomes as going up stairs [35].

http://dx.doi.org/10.5772/53382

The great majority of evidences and experiences are in favour of patellar resurfacing, so we also recommend substituting the patella [36]. This surgical detail only add a short time (less than 8 minutes) to the surgery and warrant less complains of anterior knee pain [35].

However patellar resurfacing no longer should be considered a mandatory step in TKAs. We must consider femoral and patellar design before resurfacing patella as several authors have reported nice results with patella non-resurfacing [37]. The importance of the femoral design (patella-friendly component) is of maximum significance as coupling patella design provides better anterior knee pain results and improved knee functions. Routine patellar replacement in TKA cannot be defended when a coupling femoral component is available [37]. However, proper femoral component design is necessary in order to compare patellar resurfacing and non-resurfacing.

As we can see many features influence patellofemoral function after TKAs but surgical technique is one the primary factors affecting patellar alignment [10], so we can conclude that surgical technique and accurate placement of the implants are of crucial importance in patella resurfacing and a careful procedure improves outcomes.

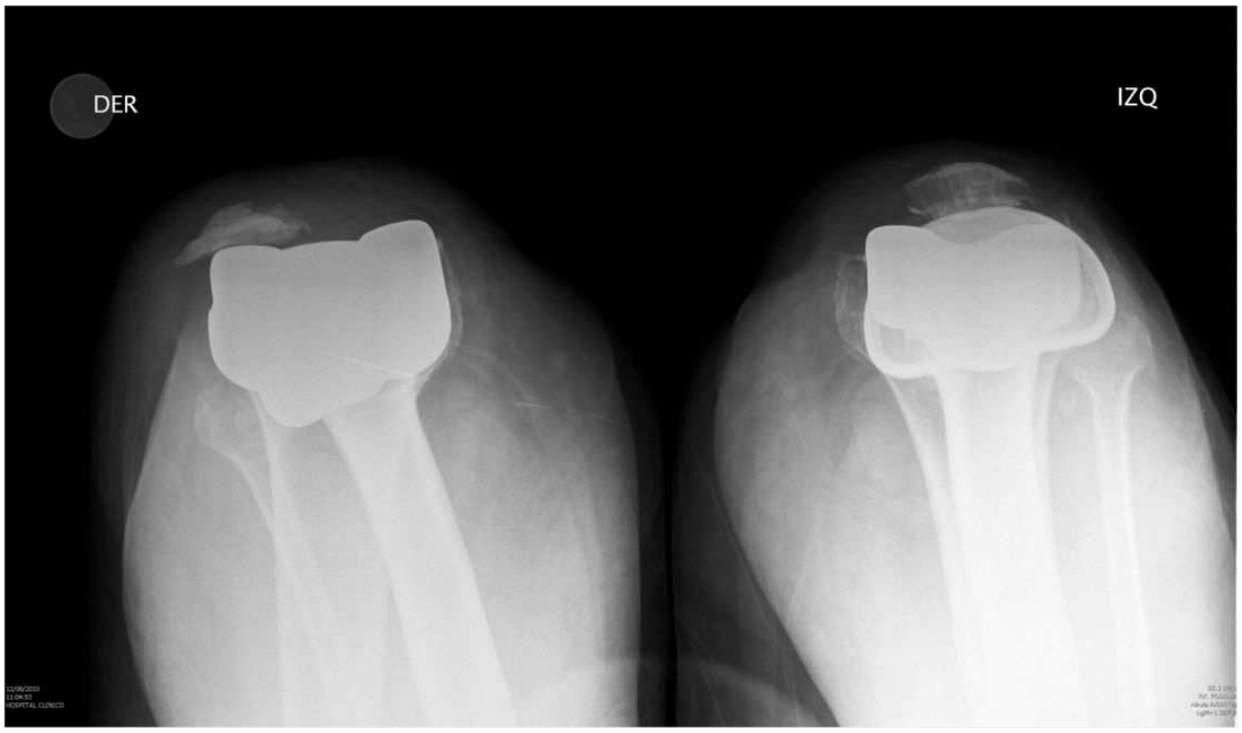


Figure 1. Advanced-age patient suffered subluxation of the extensor mechanism due to a patella infera, after total knee replacement. It was well tolerated; orthopedics measures were employed (a brace and avoiding activities that aggravate instability)

The determination whether to resurface the patella or not is still nowadays controversial [25]. Some trials have concluded there are no advantages in routine patellar resurfacing [38, 39] meanwhile other reports [40] and some meta-analyses [2-4] show less anterior knee pain, better functional outcomes and lower rates of revision after patella resurfacing.

We believe the ultimate result of the patella treatment in total knee replacement is multifactorial and depend on patient factors (illness, previous pain, age, weight, BMI...), surgical technique (features shown before), implant design (trochlear groove, tibial implant, patella size and thickness) and above all a proper placement of the components.

However pain is the main reason why the patients seek for a TKA. They accept undergo this procedure to alleviate pain and to restore as best function as possible. Literature reports better functional results and less pain after patellar resurfacing. It seems not fair to avoid patellar resurfacing for financial criterion or because longer surgical times. If extensor mechanical problems are not as frequent as our series shows and look like these complications could be an acceptable risk, why not to resurface the patella?



Figure 2. Frank dislocation of the patella who required revision surgery. Internal rotational alignment of the femoral component made us to revise it, getting good functional outcome after surgery.

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Figure 3. Loosening of the patellar insert that required removing of the polyethylene. As quality of remaining bone wasn't good, no other all-polyethylene implant was placed

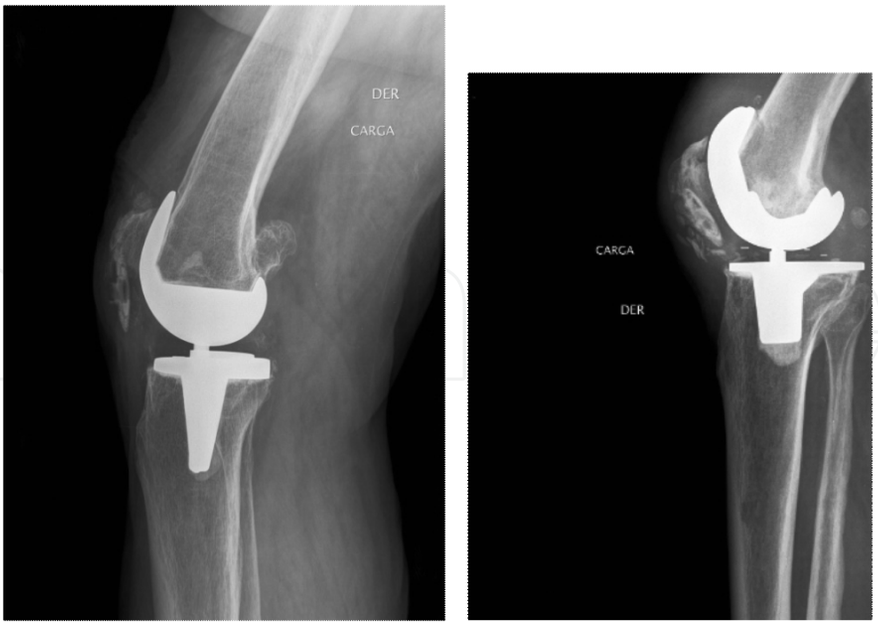


Figure 4. Two examples of fracture of the patella with loosening of the patella. The patients referred a previous trauma in both cases and revision surgery with extensor mechanism reconstruction was done.

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