

Outcome of knee arthroplasty. Does the opinion of the surgeon coincide with that of the patient?

D. Hernández-Vaquero^{a,b}, J. Cervero-Suárez^b, M. de Cima-Suárez^b, M.C. Cuervo-Olay^b and J.M. Fernández-Carreira^c

^aDepartment of Surgery. School of Medicine. Oviedo. Spain.

^bDepartment of Orthopedic and Trauma Surgery. San Agustín Hospital. Avilés. Asturias. Spain.

^cResearch Support Unit. San Agustín Hospital. Asturias. Spain.

Purpose. The purpose of this paper is to find out whether after knee arthroplasty the opinions of patient and surgeon coincide regarding functional evolution and pain.

Materials and methods. A questionnaire was administered to 50 patients subjected to total knee replacement as well as to the surgeons in charge of the procedures. The purpose was to find out the degree of concordance of the opinions of both groups in terms of the current evolution of the process. Five factors were analyzed, two of them by means of a visual-analog scale (patient satisfaction and pain) and the remaining three through a four-grade scale (ability to walk, level of physical activity and fulfillment of preoperative expectations).

Results. 62% of the responses of surgeons and patients concurred. As regards general satisfaction with the procedure, no significant differences were found between the opinions of both groups. As far as pain was concerned, there were fairly significant differences since the surgeons tended to relieve that patients had less pain than they really experienced. Differences were also found in terms of the ability to walk: in general patients had more walking limitations than surgeons were willing to recognize. As for the fulfillment of preoperative expectations, surgeon and patient opinions tended to coincide.

Conclusions. Further to knee arthroplasty, patients tend to take a grimmer view of their pain and walking ability status than the physicians that operated on them.

Key words: knee arthroplasty, results, quality of life, surgeon's opinion.

Resultados de las artroplastias de rodilla ¿Coinciden la opinión del cirujano y la del paciente?

Objetivos. Conocer si después de una artroplastia de rodilla la opinión del paciente y del cirujano es coincidente en cuanto a la evolución funcional y el dolor.

Material y método. Se ha realizado una encuesta a 50 pacientes intervenidos con una artroplastia total de rodilla, así como a los cirujanos responsables. El objetivo era conocer el grado de coincidencia de ambos en cuanto a la situación actual de la evolución del proceso. Se analizaron 5 aspectos, dos de ellos a través de una escala analógico-visual (satisfacción del paciente y presencia de dolor) y otros tres mediante una escala de 4 grados (capacidad de deambulación, nivel de actividad física y cumplimiento de las expectativas preoperatorias).

Resultados. El 62% de las respuestas coincidían entre los cirujanos y los pacientes. En la satisfacción general tras la intervención no se encontraron diferencias significativas entre las opiniones de ambos. La presencia de dolor mostró diferencias estadísticamente significativas; el cirujano cree que el paciente tiene menos del que verdaderamente padece. Se encontraron también diferencias en cuanto a la capacidad de deambulación; el paciente tiene más limitaciones para la deambulación, creyendo el cirujano que el paciente camina mejor. En cuanto a la consecución de las expectativas previas al procedimiento quirúrgico, la opinión mayoritaria era coincidente entre el cirujano y el paciente.

Conclusiones. Tras una artroplastia de rodilla la situación en cuanto al dolor y la capacidad de deambulación son peor valoradas por el paciente que por el cirujano que le ha intervenido.

Palabras clave: artroplastia de rodilla, resultados, calidad de vida, opinión del cirujano.

Corresponding author:

D. Hernández Vaquero.
Apartado de Correos 341.
33400. Avilés. Asturias. Spain.
E-mail: dhernandezv@meditex.es

Received: November 2006.

Accepted: February 2007.

The outcome of total knee arthroplasty (TKA) can be evaluated in four different ways¹: firstly, considering clinical improvement (joint mobility, function, ambulation and

pain); secondly, through perceivable results of exploratory techniques (radiography, scintigraphy, density scan, etc.); thirdly, studying the curve or survival rate that informs on the percentage of arthroplasties that, with the passing of time, remains implanted and without complications; fourthly, observing the changes brought about by this treatment on the patient's life quality (the patient's overall impression is assessed as well as the benefits he believes to have obtained in daily activity and well-being as a result of the treatment). The first three methods yield objective information that is taken up by the surgeon or researcher, whereas the fourth method provides the subjective opinion of the person who has undergone arthroplasty.

There is a great number of works informing on the excellent results obtained with TKA in the middle and long terms², and various grading scales are known, but the assessment of this procedure through the patient's point of view is not so frequent. In fact, it could happen that the improvement obtained with the treatment is valued dissimilarly by the surgeon and the patient. In order to find out whether there was this kind of discrepancy we asked patients and the surgeons who operated on them and who examine them periodically to fill in a survey. Hence, the aim of this work is not to learn the result of a TKA series but rather to compare the patient and surgeon's opinion regarding the outcome of a particular procedure.

MATERIALS AND METHODS

Design of the study

The study was retrospective and on 50 patients that had undergone TKA due to tricompartmental arthritis. The study consisted in collecting the opinions of the patient and the surgeon who operated on him and was in charge of the follow-up visits. Specialist surgeons belonging to the same Service and who habitually perform TKA were included in the study.

Inclusion criteria

Patients were selected randomly from among those outpatients who made follow-up visits during the three months of the study (January-March 2006) and who fulfilled the following requirements: minimum follow-up period of 24 months, appropriately registered medical history, complete record of the status of their arthroplasty, both clinically and radiographically.

Exclusion criteria

The cases that were excluded were those in which arthroplasty had presented evident complications during surgery or in the post-op period and those in which the sur-

geon in charge did not show certitude regarding their evolution.

Sixty-two histories were analyzed from which 50 were finally chosen for closer study; 12 cases did not meet the inclusion criteria and were consequently rejected.

Patient mean age was 70.2 (standard deviation 6.7 [DE]), ranging between 52 and 84 years. Mean weight was 80 kg (11.8 DE), ranging between 55 and 105 kg. Forty-one patients were women and the prosthetic model implanted in all the patients was an Interax arthroplasty (Stryker Orthopaedics, Mahwah, New Jersey, USA) with cementing in all of its components.

The parameters that were analyzed were the following: general satisfaction, pain existence, ambulatory capacity, activity level, and fulfillment of expectations held prior to surgery. Both patients and surgeons opinions regarding these aspects were required in a personal interview carried out by one of the authors (JCS). When the patient made a medical visit on a previously arranged date he was received individually and asked to fill in a questionnaire with the points mentioned above. The surgeons were asked for their opinion on the same day they had examined the patient and they were shown the medical history and the annotations they themselves had made so that they could recall the situation of the patient. Obviously, surgeons were not informed about the patient's opinion.

General satisfaction and pain were included on a visual analog scale ranging from 1 to 10. Activity level, ambulatory capacity and expectation fulfillment were classified into 4 grades, from 1 to 4 (Table 1).

The data obtained from the surveys, which formed a series of 250 items, were taken up on a calculus sheet and

Table 1. Assessment scale for analyzed parameters

| Studied parameter | Grading |
|-------------------------|---|
| General satisfaction | 1 to 10 |
| Pain degree | 1 to 10 |
| Activity level | 1 none or confined to wheel-chair 2 sedentary: minimum ambulatory capacity 3 slight activity: domestic activities, strolls 4 total activity: no restrictions, sports |
| Ambulatory capacity | 1 not possible 2 aided by walking stick or walker 3 aided by a walking-stick 4 freely, with no aid |
| Expectation fulfillment | 1 none at all 2 partial, would not undergo surgery again 3 partial, would undergo surgery again 4 complete |

Tabla 2. Studied parameters and their statistical significance

| Analyzed parameter | Patient's opinion more negative than surgeon's | Coincidence between patient and surgeon | Patient's opinion more positive than surgeon's | p |
|----------------------------------|--|---|--|-------|
| General satisfaction | 24% | 50% | 26% | 0,817 |
| Pain | 36% | 44% | 20% | 0,07 |
| Activity | 10% | 58% | 32% | 0,007 |
| Ambulation | 20% | 76% | 4% | 0,01 |
| Previous expectation fulfillment | 12% | 84% | 4% | 0,26 |

were analyzed statistically through Chi-square tests so as to compare the proportion of patients whose opinion was more positive than the surgeon's against the proportion whose opinion was more negative, coincidences being discarded. A factorial analysis was also carried out in order to find the possible underlying factors related to the questions asked. Factorial analysis of main components is a multivariate analysis method of an exploratory kind.

RESULTS

Generally speaking, there was a 62% coincidence between surgeons and patients.

As regards the first aspect that was analyzed—general satisfaction after surgery (assessed by analog scale)—in 13 cases the patient was in a better condition than the one stated by the surgeon; in 12 cases the patient was in a worse condition; and in 25 cases there was coincidence. There were no significant differences between the levels of satisfaction manifested by surgeons and patients.

Pain was also recorded using a visual analog scale graded from 1 to 10. Ten patients felt less pain than the surgeon thought they would; 18 felt greater pain; and in 22 cases opinions were coincidental. There were statistically significant differences between the surgeons' and the patients' opinions. Judging by our results, surgeons usually believe patients suffer less pain than they actually do.

Activity level was graded from 1 to 4. Sixteen patients showed a higher level of activity than the one declared by the surgeon in charge. In 5 patients the level of activity was lower, and in 29 cases the declared levels were coincidental. Statistically significant differences were found between the surgeons' and patients' opinions in the cases with no coincidence.

In 38 cases the degree of ambulatory capacity expressed by surgeons and patients was the same. In two cases ambulatory capacity was higher than the one declared by the surgeon, but in 10 cases the opposite was the case; that is to say, the patient's ambulatory capacity was lower than the surgeon thought it would be. There were significant differences between non-coincidental opinions. We found that the patients' ambulation was more limited than the surgeons declared it was.

Lastly, we assessed the fulfillment of the expectations that the patient had before surgery; in other words, we evaluated whether the TKA had satisfied the patient's anticipation of the results before he underwent surgery. In 42 cases there was a coincidence between the surgeons' and the patients' opinions, showing that expectations had been fulfilled for both groups.

Table 2 shows the results obtained for the 5 parameters we studied together with their statistical significance. Following factorial analysis, two apparently independent factors are obtained: the first is formed by the variables for general satisfaction, previous expectation fulfillment, and the inverse of pain, which could be labeled well-being; the second factor is formed mainly by the variable for ambulatory capacity.

DISCUSSION

In studies that were based on community work it is considered that 85% of the cases treated with TKA obtain satisfactory results, there being permanent pain decrease, improvement in physical activity and satisfaction in middle and long term follow-up². However, to get a better picture of the impact of TKA on patient well-being, we must use life quality indexes. These were introduced several years ago and are based on the concept that health is more than just the absence of illness, a concept which the World Health organization has endorsed. Life quality is difficult to define because it depends for the most part on the values adopted by each person, on the emotional and personal resources they possess and on their vital and social environment. Life quality as related to health is health as perceived by each person and comprises aspects that are related to physical and mental performance, as well as to the feeling of well-being. The concept of life quality is general and ambiguous; in order to assess it we must consider medical factors, social, family and cultural circumstances, and even economic factors. Due to this its inclusion does not provide a solution for adequate research into arthroplasty. However, this kind of analysis is becoming more and more frequent in the literature in spite of its limitations, and to such an extent that in the future the results of medical or surgical treatment may have to be endorsed by the patient's opinion, the

changes brought about on his well-being and life quality, analogies with results obtained in other hospitals by different surgeons as well as an appropriate cost-benefit estimation. With respect to this last item life quality analysis is interesting not only as data for the scientific study of the results but also in the areas of sanitary economy and health systems management. There is a multiplicity of systems to assess life quality in relation to health³. They usually consist in a questionnaire with which the patient himself evaluates his life quality and the effect of a medical procedure on his well-being. These scales generally assess pain, satisfaction and disability, and they are also applied in the analysis of cost utility for the assignment of resources⁴. In specific applications in arthroplasty the scales in use generally assess the following: physical functions that include mobility and self-care; psychological well-being; certain subjective symptoms such as pain, fatigue, sleeplessness or energy; social activity; permanence in occupation or labor, domestic or leisure activity; and, lastly, cognitive functions such as alertness⁵. This list of assessed items has come to be called "outcomes" in the English speaking world, which can be translated as the "final results" or "global efficacy" of a medical procedure⁶. In order to assess adequately the effect of TKA, it is necessary to observe the presurgical situation so as to compare it with the postsurgical situation. Although it seems reasonable to think that the latter will depend on the former, some recent works⁷ have found no relation between the previous and final situations with reference to the life quality of patients that underwent TKA or total hip arthroplasty. In other words, the final results could be independent from the situation existing before the procedure.

TKA is a procedure that notably improves the life quality of patients, who generally refer great satisfaction after surgery and subsequent rehabilitation. A prospective community study of series in which 48 surgeons and 25 hospitals took part⁸, showed that with a minimum two-year follow-up, 88% of the patients were satisfied with the results obtained with this procedure. There are certain factors that could modify this percentage, however, such as the performance of under 50 TKA per year in some centers. Other works that are based on national registers of TKA also show these excellent results; only 8% of the patients analyzed by Robertson et al⁹ were not satisfied with the TKA performed on them from 2 to 17 years before the survey. The levels of satisfaction expressed by patients in different countries have also been studied. A recent work has shown that Australian patients, whose main characteristic is their high level of expectations previous to surgery, were less satisfied with a TKA than the English or the USA patients, and many did not wish to undergo another surgery.

Other techniques for evaluating results, such as objective scoring scales, quantitative assessment of exploratory results or the analysis of implant survival rates are carried out by the surgeon or by an independent observer, but still

alien to the patient. Even though the patient's opinion is taken up by the survey – the element of subjectivity that this entails may modify results. In point of fact, what does the success of arthroplasty depend on? Who is to measure its results? Is the situation similar for the surgeon and the patient? It is possible that the patient's aims when he agrees to be implanted with arthroplasty are not the same the surgeon has in mind when he recommends it. The patient's main preoccupation concerns relieving the pain and restoring function and mobility; the surgeon, on the other hand, also has in mind correct implant alignment, and satisfactory fixation to bone. Apart from all these objectives there is the need that the cost of the implant should be affordable by the sanitary system, that the production materials should be modern and biocompatible, that the model should have a sufficiently large bibliographical backing, that it should be available in a determined hospital, that the technique should be simple and repeatable and even that it should allow for easy revision surgery if necessary. With such different objectives it is to be expected that the surgeons and patients' opinions on the obtained results should, in many cases, not be convergent.

Studies of the results of orthopedic procedures that compare the patients and surgeons' opinions are infrequent, and even more so in the case of arthroplasty. Some classical studies¹¹ affirm that the surgeon's evaluation of the result of a hip arthroplasty is, on many occasions, not identical with the patient's evaluation. Lieberman et al¹¹ used a visual analog scale where the patient included his degree of pain and of satisfaction as well as an assessment of his general health, functional capacity, modification of pain intensity, arthroplasty effect on his well-being and, on the whole, whether his expectations regarding surgical procedure had been fulfilled. On an analog scale (graded from 0 to 100 mm) the patients expressed greater pain and less satisfaction than the surgeons had noted, using the same scale. The differences were statistically significant and even more striking in the group of patients with higher levels of pain and lower levels of satisfaction. In other words, if evolution is satisfactory, patients and surgeons make similar evaluations of the results, but if evolution is unsatisfactory the difference between the evaluations is greater, and surgeons generally tend to assign better results than the patient himself, who is bearing the implant.

Brokelman et al¹² analyzed patient and surgeon satisfaction after a hip arthroplasty in 193 cases using a methodology that was similar to the one used by us. They studied the opinions by means of a visual analog scale, two subjective and two objective scoring systems. They found, as in the article described above, that in patients with a lower degree of satisfaction the surgeon was more satisfied than the patient. As far as the patient is concerned, feeling pain during his daily activities is the most determining factor in assessing well-being after surgery.

Bullens et al¹³ also used a visual analog scale, apart from other kinds of questionnaires, to determine patient satisfaction compared to surgeon opinion after a TKA. Their results show that the two groups have different priorities, and they recommend applying this simple scale to complement other systems of assessing results. The contrast between subjective and objective evaluations proved there was an inadequate correlation. Sharkey et al¹⁴, working along this same line, analyzed the factors that determine the selection of a hip or knee implant depending on the surgeon's or the patient's point of view.

In our series we have found no difference between the level of satisfaction expected by the

surgeon and the one expressed by the patient, nor in the fulfilling of the expectations held prior to surgery. However, differences were striking when pain and ambulatory capacity were evaluated. Our patients experience greater pain and difficulties for walking than the levels expected by the surgeon who operated on them. Similarly to other studies, we confirm that surgeons are more optimistic than patients regarding these parameters. This may be due to the fact that patients do not inform their surgeons about their situation adequately and realistically, probably owing to a fear of losing the surgeon's trust. Or it could be explained by the fact that surgeons often base their opinions on the information derived from the surgical technique itself and from the radiological and clinical results he has obtained. It is also probable that the surgeon may think that the result of the procedure involves only him and thus consider that he is the only person that can assess the result appropriately.

Our findings have also shown that the answers provided by surgeons and patients regarding the 5 parameters we studied can be classified into two groups that are independent from each other: the first group comprises general satisfaction, fulfillment of previous expectations and the inverse of pain level, which could be labeled "well-being"; these three parameters are usually coincidental in the surgeon and patient's evaluation, yielding similar scores. The second group is formed mainly by ambulatory capacity. These slight contrasts and differences should be studied more thoroughly in future, constituting an interesting line of research.

The studies in which there was a coincidence in the opinions of surgeons and patients, the two essential actors in a TKA, could contribute to the analysis of satisfaction following sanitary attention. It is possible that the surgeon's main aim when performing a procedure does not coincide with the patient's wish, and also that our results are not as optimal as we may think they are.

REFERENCES

1. Hernández Vaquero D, Barrera Cadenas FJ. Sistemas de evaluación de los resultados en las artroplastias. *Rev Ortop Traumatol.* 1999;43:245-2.
2. Hawker G, Wright J, Coyte P, Paul J, Dittus R, Croxford R, et al. Health-related quality of life after knee replacement. *J Bone Joint Surg Am.* 1998;80A:163-73.
3. Fernández Carreira JM, Hernández Vaquero D, Sánchez Torres M. El concepto de calidad de vida asociado a la salud. Sus aplicaciones en cirugía ortopédica y traumatología. En: Actualizaciones SECOT 2. Barcelona: Masson, S.A.; 2001. p. 15-8.
4. Beaton DE, Schemitsch E. Measures of health-related quality of life and physical function. *Clin Orthop.* 2003;413:90-105.
5. Lizaur Utrilla A, Miralles Muñoz F, Elías Calvo R. La calidad de vida tras las artroplastias totales de cadera y rodilla. *Rev Ortop Traumatol.* 2002;46:31-5.
6. Cáceres-Palou E, López-Prats F, Mesa-Ramos M, Sánchez-Sotelo J, Suso-Vergara S. Valoración de resultados en cirugía ortopédica y traumatología. *Rev Ortop Traumatol.* 2005;49 Extra 1:119-42.
7. Bauman C, Rat AC, Osnowycz G, Mainard D, Delagoutte JP, Cuny C, et al. Do clinical presentation and pre-operative quality of life predict satisfaction with care after total hip or knee replacement? *J Bone Joint Surg Br.* 2006;88B:366-73.
8. Heck DA, Robinson RL, Partridge CM, Lubitz RM, Freund DA. Patient outcomes after knee replacement. *Clin Orthop.* 1998;356:93-110.
9. Robertsson O, Dunbar M, Pehrsson T, Knutson K, Lidgren L. Patient satisfaction after knee arthroplasty. A report on 27,372 knees operated on between 1981 and 1995 in Sweden. *Acta Orthop Scand.* 2000;71:262-7.
10. Lingard EA, Sledge CB, Learmonth ID. Patient expectations regarding total knee arthroplasty: differences among the United States, United Kingdom, and Australia. *J Bone Joint Surg Am.* 2006;88A:1201-7.
11. Lieberman JR, Dorey F, Shekelle P, Schumacher L, Thomas BJ, Kilgus DJ, et al. Differences between patients' and physicians' evaluations of outcome after total hip arthroplasty. *J Bone Joint Surg Am.* 1996;78A:835-8.
12. Brokelman RBG, van Loon CJM, Rijnberg WJ. Patient versus surgeon satisfaction after total hip arthroplasty. *J Bone Joint Surg Br.* 2003;85B:495-8.
13. Bullens PHJ, van Loon CJM, de Waal Malefijt MC, Laan RFJM, Veth RPH. Patient satisfaction after total knee arthroplasty. A comparison between subjective and objective outcome assessments. *J Arthroplasty.* 2001;16:740-7.
14. Sharkey PF, Sethuraman V, Hozack WJ, Rothman RH, Stiehl JB. Factors influencing choice of implants in total hip arthroplasty and total knee arthroplasty: perspectives of surgeons and patients. *J Arthroplasty.* 1999;14:281-7.

Conflict of interests

The authors have declared that they have no conflict of interests.