IJCNP, Volume 3, Issue 12, 2025 ISSN: 2995-536X
https://medicaljournals.eu/index.php/IJCNP

INTERNATIONAL JOURNAL OF COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

DYSPLASTIC COXARTHROSIS USING THE PROPOSED

YUSUPOV SIROJIDDIN YUNUSOVICH
BUKHARA STATE MEDICAL INSTITUTE NAMED AFTER ABU ALI IBN SINO. BUKHARA, UZBEKISTAN
sirojiddin_yusupov@bsmi.uz
https://orcid.org/0009-0007-1320-4327

Abstract: The treatment of dysplastic coxarthrosis remains one of the most difficult problems in modern orthopedics. Reconstructive operations such as pelvic and proximal femoral osteotomies show high effectiveness only in the early stages of the disease and usually ensure improvement for a limited period of five to ten years. In advanced stages, the most reliable method of care is total hip arthroplasty, which allows significant pain reduction, restoration of joint function, correction of limb length, and return of patients to active daily life. Despite major progress in implant design and surgical techniques, there is still no unified approach to optimal placement of the acetabular component, use of bone grafting, and management of cases with complete congenital hip dislocation. The study performed a comprehensive clinical and radiological analysis of long-term outcomes of hip replacement in patients with different degrees of joint dysplasia and compared them with a control group of patients without dysplastic changes. Mathematical evaluation identified key prognostic factors influencing functional results and complication risks. On the basis of these findings, practical algorithms for choosing surgical tactics were developed and tested. Application of the proposed decision-making system reduced the frequency of complications and improved medium term functional results. The use of individualized algorithms represents an effective tool for achieving outcomes comparable to those in idiopathic osteoarthritis, thereby enhancing quality of life for this complex category of patients.

Key words: dysplastic coxarthrosis, total hip arthroplasty, acetabular component placement, congenital hip dislocation, prognostic factors, surgical algorithms, complications, functional results, radiological analysis, mathematical modeling.

Introduction.

In Reconstructive surgical interventions aimed at preserving and restoring normal anatomical relationships in the joint (various variants of pelvic and proximal femoral osteotomy) are very effective in the early stages of the disease, but, unfortunately, they provide a positive result only for 5-10 years, and in the later stages their effectiveness decreases sharply. Accordingly, the main way to help such patients remains the operation of total arthroplasty of the joint. It allows you to eliminate or significantly reduce pain, restore function, and return the patient to an active life, even in situations that seemed hopeless until relatively recently. For degenerative and dystrophic diseases of TB, more than 193,000 primary endoprosthetics have been performed. Even 30 years ago, arthroplasty for DKA, especially with complete dislocation of the hip, was considered ineffective. After analyzing the results of total TBS arthroplasty in dysplastic coccarthrosis, he recommended to refrain from the procedure of TBS joint arthroplasty in severe dysplasia. A clear understanding of the problems associated with this pathology led him to express such a categorical opinion. Since then, significant changes have taken place and significant progress has been noted in the issues of TBS endoprosthetics. However, up to the present day, the problem of helping such patients has not been completely solved, and an active discussion continues around the world on some key issues of endoprosthesis in DKA.

The following aspects remain the most controversial: the installation of the acetabulum component (VC) of the endoprosthesis in different positions relative to the true (calculated) center of rotation of the TBS, the use of bone grafting of the upper edge of the acetabulum and its combination with cement and cement-free fixation of implants, methods of endoprosthetics of the TBS with complete dislocation of the hip. This is possible only if the center of rotation of the artificial joint (and hence the acetabulum component) is in the usual anatomical position, which will restore the equality of the length of the lower extremities and muscle tone. There is an opinion about the legitimacy

of the high location of the TBC rotation center, when the lower edge of the VC is more than 3 cm above the tear shape. Other orthopaedists insist on restoring the TBS rotation center, emphasizing the viciousness of its high location, as this may result in dislocation of the endoprosthesis head, accelerated wear of its working surfaces, and inadequate function of the abductor muscles of the thigh.

It was noted that the results of such an intervention progressively worsened, and after 16 years, up to 60% of bone cement-implanted VC underwent surgical revision. With the advent of cement-free fixation implants, they began to be actively used in combination with bone grafting during TBS arthroplasty operations for DKA. With a follow-up period of 5-7 years, there were no signs of VC instability, but in 70% of the observations, significant bone resorption of the autograft in the lateral sections was noted. Currently, there is a discussion in the specialized literature about TBS arthroplasty in case of complete dislocation of the hip. Issues such as the possibility of installing a femoral component in the area of the "false" acetabulum, the need for resection of the proximal femur, and the possibility of two-stage arthroplasty are discussed. One of the factors indirectly indicating the unresolved problem of TB replacement in DKA is the frequency of revision interventions. According to both domestic and foreign orthopaedists, during the first five years it reaches 5-17%. All of the above facts indicate that today there is no unified view on the choice of optimal tactics for hip replacement in patients with deforming osteoarthritis, which indicates the urgent need to find modern solutions. For the first time, a comprehensive clinical and radiological analysis of the long-term results of hip replacement with modern implants in patients with various degrees of hip dysplasia was performed on representative domestic clinical material in comparison with the control group of patients who had deforming coxarthrosis without signs of dysplasia. Mathematical analysis has revealed significant prognostic factors affecting the effectiveness of hip replacement surgery in patients with dysplastic coxarthrosis.

Based on a comparative analysis of the functional results of various hip replacement techniques in patients with complete hip dislocation, the indications for their clinical use have been clarified. Based on the mathematical analysis, the factors were identified, the totality of which allows predicting the effectiveness of hip replacement operations in patients with dysplastic coxarthrosis. Indications for choosing the most rational options for installing the acetabulum component of a total hip arthroplasty have been determined, depending on the degree of joint dysplasia and previous surgical interventions. An algorithm for choosing a hip replacement method in patients with congenital hip dislocation is proposed. The use of the developed algorithms for choosing surgical tactics in patients with various degrees of hip dysplasia reduces the risk of complications and improves the functional results of surgical treatment, which significantly improves the quality of life of this complex category of patients. Total hip replacement in patients with dysplastic coxarthrosis using the proposed algorithms for choosing the optimal surgical treatment option is an effective operation that allows achieving medium-term results comparable to the treatment outcomes of patients with idiopathic osteoarthritis of this joint. The nature of the operations performed and the long-term results of total hip replacement in its dysplasia are largely determined by the severity of this pathology. Optimal functional results of total hip replacement in patients with dysplastic coxarthrosis are achieved when the acetabulum component of the endoprosthesis is placed in an "anatomical" position with the restoration of the joint rotation center. Implantation of the acetabulum component of the "press-fit" fixation with a displacement of the center of rotation of the joint in the craniolateral direction does not lead to an increase in the risk of aseptic loosening in the medium term, but significantly worsens the functional results of surgical treatment.

However, the functional results of such operations are significantly worse than with endoprosthetics without bone grafting, even in cases where the center of rotation of the joint has to be shifted to the medial side. In case of unilateral congenital dislocation of the hip with a shortening of the lower limb by more than 5 cm, as well as in case of significant deformation of the proximal femur after previous operations, it is advisable to perform total hip replacement using osteotomy of the proximal femur.

Optimal functional results of hip replacement in patients with dysplastic coxarthrosis are achieved when the acetabulum component (VC) of the endoprosthesis is placed in an anatomical position with the restoration of the joint rotation center. Implantation of the VC "pressfit" fixation with a shift of the center of rotation in the craniolateral direction does not lead to an increase in the risk of its aseptic loosening in the medium term, but significantly reduces the functional result of surgical treatment. Bone grafting of the upper edge of the acetabulum with a massive autotransplant makes it possible to install the "press-fit" fixation system in the most advantageous anatomical position. However, the functional results of such operations are significantly worse than those of similar interventions without bone grafting, even in cases of displacement of the center of rotation of the artificial joint to the medial side. In case of unilateral congenital dislocation of the hip with a shortening of the lower limb by more than 5 cm, as well as in case

of significant deformation of the proximal femur after previous operations, joint replacement using osteotomy of the proximal femur may be recommended. Prognostically significant clinical and radiological factors in hip dysplasia of the first degree are the patient's age, the sum of the Harris scale scores at the time of surgery and the angle of inclination of the acetabulum component (VC) of the endoprosthesis, and in dysplasia of the second and third degrees — the angle of inclination of the acetabulum, the angle of inclination of the VC and the degree of displacement of the center of rotation of the endoprosthesis laterally. Intraoperative (7.0%) and postoperative (8.3%) complications of total hip replacement in patients with dysplastic coxarthrosis are significantly more common than in the control group with ideopathic coxarthrosis (1.8% and 1.8% of cases, respectively). In patients with grade I hip dysplasia, they were noted in 3.2% and 7.1% of cases, respectively, in 7.5% and 7.5% of cases with grades II and III, and in 36.8% and 21.1% of cases with grades IV.

Conclusions

Plastic surgery of the upper edge of the acetabulum with a massive autotransplant from the removed femoral head in patients with dysplastic coxarthrosis is indicated only in cases of prediction of under-coverage of the acetabulum component of the implant on more than 30% of its surface. It should be performed only when using the acetabulum component of the "press-fit" fixation in those clinical situations when its installation using other techniques is impossible. Total hip replacement for congenital hip dislocation is a technically very complex operation that should be performed only in specialized institutions with qualified surgical staff, the necessary equipment and facilities, as well as the possibility of individual selection of the implant from a variety of available models and sizes.

References:

1. Akramov V.R. / Optimization of methods of treatment and rehabilitation of patients with aseptic necrosis of the femoral head. // Abstract of the dissertation. for DSc. Tashkent. 2021; 65 p.

2. Chen H.T. et al. / Structural and Morselized allografting combined with a cementless cup for acetabular Defects in Revision Total Hip arthroplasty: a 4- to 14-year follow-up. // Biomed Res Int. 2018 feb 4; 2018:2364269. DoI: 10.1155/2018/2364269.

3. Hao Y, Luo D, Wu J, et al. A novel revision system for complex pelvic defects utilizing 3D-printed custom prosthesis. J Orthop Translat. 2021;31:102-109. doi: 10.1016/j.jot.2021.09.006.

4. Haynes J.A. et al. / Contemporary surgical indications and referral trends in revision total hip arthroplasty: A 100-year review. // *J Arthroplasty.* 2016;31:622-625.

5. Ilyin A.A. and others. / The use of mathematical modeling to predict the biomechanics of hip implants. // Bulletin of traumatology and orthopedics. N.N. Priorov 2009;16(3):7–13.

6. Ilyin A.A. and others. / Substantiation of the design and investigation of the biomechanical behavior of the wedge-shaped leg of the cement fixation of the hip joint endoprosthesis. // Bulletin of Traumatology and Orthopedics. 2005; No.3:3-10.

7. Irismetov M.E., Fozilov Kh.T. Khakimov Sh.K., Safarov N.B. / Associated applicance of artroscopic debridement and proximal fibular osteotomy at the treatment of patients with deformic artritis of knee. // Genij Ortopedii. 2022. Vol. 28, no. 6. P. 768-773. doi.org/10.18019/1028-4427-2022-28-6-768-773

8. Klemt C. et al. Can machine learning models predict failure of revision THA? – Arch Orthop Trauma Surg. 2023;143(6):2805–2812.

9. Klemt C. et al. ML algorithms for predicting PROMs after TJA. – Arch Orthop Trauma Surg. 2023;143(4):2235–2245.

10. Lychagin AV, Rosenberg N, Gritsyuk AA. Evaluation of the potential complications of surgical wound drainage in primary total hip arthroplasty: a prospective controlled double-blind study. Hip Int. 2021;31(5):589-592. doi: 10.1177/1120700020941749.

11. Petrov A.B., Ruzanov V.I., Mashukov T.S. / Long-term results of surgical treatment of patients with acetabulum fractures. // Genius orthopedics. 2020;26(3): 300-305. doi: 10.18019/1028-4427-2020-26-3-300-305 25.

12. Reynaud E.V. Optimization of treatment of patients after hip replacement based on prediction and prevention of hemocoagulation disorders: // Abstract of the dissertation of the Candidate of Medical Sciences. – Perm, 2013. – 24 p.

13. Siu K.T. et al. Risk factors associated with PJI after TKA: a retrospective study of 2543 cases. – Hong Kong Med J. 2018;24(2):152–157.

14. Tikhilov R.M., Javadov A.A., Denisov A.O. et al. / Analysis of the economic efficiency of using individual and serial acetabulum structures in revision hip arthroplasty. // Genius orthopedics. 2022;28(2):234-240. doi: 10.18019/1028-4427-2022-28-2-234-240.

15. Udintseva M.Yu. and co-authors. / Primary and revision hip replacement with replacement of acetabulum defects. // Genius orthopedics. 2024;30(6):797-810. doi.org/10.18019/1028-4427-2024-30-6-797-810.

16. Valiev E.Yu. and others. / The use of modern technologies in the treatment of fractures of the proximal femur in the older age group. // Problems of biology and medicine. 2022;6.1(141):84–90.

17. Valiev E.Yu. and others. / The effect of osteoporosis and the method of fixation on the results of hip replacement. // Problems of biology and medicine. 2022;6.1: pp. 87-89.

18. Voronov A.A. and others. The problem of perioperative prognosis of purulent complications of hip and knee arthroplasty. // Genius orthopedics. Part I. 2020. – No. 1. – pp. 10-18.

19. Voronov A.A. and others. / Prediction of endoprosthetics complications: risk factors and their modification. // Genius orthopedics, 2020, No. 1. pp. 19-25.

20. Yeganeh M.H. et al. Rheumatoid Arthritis, DMARDs, and PJI: What Does a Surgeon Need to Know? – J Arthroplasty. 2018;33(4):1258–1264.