Navigated Total Knee Arthroplasty in Cases with Intra- and Extraarticular Deformities

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Editorial

Total knee replacement is a highly effective method for treatment of posttraumatic arthritis, widespread in the world. However, many patients undergoing total knee replacement remain dissatisfied with the outcome. Number of failures is due to mechanical reasons, which include the malposition of the components, which effect to the mechanical axis, the violation of the components rotation, as well as the imbalance of ligaments of the knee joint.

Some authors consider, that the deviation of the mechanical axis of the limb after total knee replacement more, than 3° decreases long-term results and increases rate of implant loosening.

According to the literature data, computerized navigation can improve the components installation accuracy of the knee joint endoprosthesis and improve clinical outcome [1-10]. Other authors did not find statistically significant differences in groups of patients using computerized navigation and standard techniques [11-22].

The injury role in arthritis development is very high. All kind cartilage injury especially intraarticular fractures lead to degenerative processes.

Benazzo et al. [23] showed indications and the results of TKA in chronic and acute trauma. Indications for TKA in acute fractures are complex and combined injury, old age and osteoporosis. 6 patients were operated, 84% good and excellent results. Paratt et al. reported fracture locations: tibia 55%, femur 27%, combined 2%, patella 16%. Patients had previous 92% surgery ORIF, 15% infection history, 10% insufficient ligaments, 44 % stiff knees. Number of infection after posttraumatic TKA increase especially in cases after ORIF.

Posttraumatic lower limb deformities are the serious group of arthritis patients with femur or tibial shaft curvature in frontal, axial and coronal position. We can examine shortening, rotation and all kind lower limb deformation. Arthritis in these patients can be the reason of only shaft fractures, but a combination of the shaft and intraarticular injury. TKA must be performed with severe curved lower limb axis. But we should restore mechanical axis in TKA. Some authors supposed, that navigated TKA valuable option for patients with deformed femurs [19].

The grate difficulties are intraarticular deformities. In such cases for knee balancing we should use more constraint components, than for extra articular deformities. In femur defects CCK components are necessary for extension gap and joint line restoration to avoid patella bacha [21]. In tibia defects we need constraint too. Sometimes we have both articular parts damaged and hing prosthesis will be the choice. In some literature we found information, that severity of virus deformity did not affect the accuracy of image-free computer navigated TKA [13].

Sometimes careful preoperative planning shows us impossibility to perform right component positioning with standard instrumentation. It depends on bony defects, ligaments, shaft malunion and soft tissue disorders. Of course, we need longstanding X-rays and it helps us, CT also is very useful. But convenient surgery will be unsatisfied. It’s impossible to use intramedullary guide, to check each millimeters, to resect in correct degrees and levels.

As we marked earlier navigation system helps us to establish all components in the best position. But in literature we met articles about normal arthritis or difficult virus or valgus deformities. There are few data about posttraumatic cases. But in some cases limb deformity is very serious and angles can not allow us to resect and to save ligaments. In such cases surgeons should decide what to do, convinient TKA, osteotomy or navigated TKA. By our opinion, orthopeadic surgeons should continue researches with navigated TKA in possttraumatic limb deformities and probably can reduce revision risk [24].

Murylev VY1,2, Rukin YA1 and Muzychenkov AV1,2

1 I.M. Sechenov First Moscow State Medical University, Moscow, Russia
2 S.P. Botkin Moscow City Clinical Hospital, Moscow, Russia

Corresponding author: Murylev VY

nmuril@yandex.ru

Murylev VY, I.M. Sechenov First Moscow State Medical University, Russia.

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