The use of the intelligent cutting guide PERSEUS during Total Knee Replacement

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Abstract

Sub-optimal post-operative anatomical and mechanical alignment has been described as a cause of Total Knee Arthroplasty (TKA) revision. In fact, mechanical alignment exceeding ± 3 has been reported to increase the risk of early failure following TKA. For this reason, alignment guides have been developed to improve the accuracy of femoral and tibial cuts during surgery. Recently, it has been introduced a new system (PERSEUS) that aim to help surgeons during bone cuts, reducing the complexity of conventional alignment and sizing tools.

PERSEUS system is an intelligent cutting guide, powered by gyro sensors, that allows surgeon to perform perfectly aligned resections with less effort and morbidity, compared to conventional instrumentation for TKA. It enables to perform bone resections without using intramedullary rods, reducing the risks of a more invasive surgical approach and ensuring the optimal final limb alignment. With the use of a disposable sensor and a touchscreen interface (IPAD), the surgeon could verify the correct placement of the cutting-guide relating to the femur. During surgery, the real-time cutting plan can be approved or declined or modified, according to the choice of the surgeon. This system appears to be less risk and more safety if compared to other Computer Navigation Systems. Further, it avoids risks related to intramedullary nail and it is easier to use, increasing confidence in surgical decision. From January 2016 to March 2018, we treated 15 patients affected by knee osteoarthritis using the Perseus System. After post-operative CT evaluation, correct placement of the tibial and femoral component was obtained in all cases.