



Orthopedic Surgery (Artificial Joints)

History of artificial joints and the current status

Artificial joint replacements has evolved by the development of implants during the past 50 years. Improved materials have extended durability exponentially, which is directly linked to long-term results, and improved design has been reviewed to reproduce function close to human biology. The surgical procedure continues to evolve dramatically, including patient-friendly minimally invasive surgical techniques, effective approaches to early recovery, and currently robot-assisted improved precision.

With these developments, the evaluation of artificial joint replacement has moved from the search for simple long-term results to the evaluation of their range of motion, and to patient satisfaction today.

It is no exaggeration to say that the current artificial joint replacements are expected to provide stable long-term results for joint diseases such as osteoarthritis and rheumatoid arthritis.

These developments in artificial joint replacement have shortened the length of hospital stay and accelerated recovery, resulting in higher patient satisfaction. The number of cases, even with knee conditions alone, has doubled in Japan over the past decade; however, its prevalence rate is far lower than that in other countries, which is not well known. Westerners who value an active life choose artificial knee joints at an early stage if they experience strong pain and X-rays confirm a decrease in the cartilage tissue around the knee joints. In Japan, the number of hip replacement procedures are only 1/4 of the average in OECD countries, and knee replacements, only 1/2. In particular, when compared to the countries with the highest number of cases, the number of hip joint replacements are 1/7 or less and knee joints, 1/4 or less in Japan.

The importance of maintaining mobility in aging societies

Japanese have one of the top life expectancies in the world. However, the bones and joints are not able to cope with the longer life-span. The main cause of long-term care is stroke for the pre-elderly (65 to 74 years old), and is motive organ disorder, including debility due to aging, fractures and falls, and joint diseases, for the very elderly (older than 75 years of age). Furthermore, motive organ disorder is not only a causative disease for support or long-term care, but also a risk factor for indirect dementia and long-term care that hampers social participation. Arthrosis affecting motor system, particularly joint function, is directly linked to healthy life expectancy. For arthrosis of the knee alone, there are already 10 million patients with painful joints. The number of potential patients is said to be about 30 million. Early intervention can reduce medical costs and realize improved QOL and prolong healthy lifespans.

In this way, orthopedic medical devices contribute significantly to extend healthy life expectancy. If patients receive appropriate diagnosis and treatment options, they can have the opportunity to take an effective course of action at an early stage, including surgery before the bones and joints weaken. This can reduce the risk factors of indirect dementia and long-term care that hampers social participation.

To realize this, for example, diagnosis of joint function (beyond patient inquiry / X-rays) can be added to health check-ups. Then, the risk of developing arthrosis can be identified at an early stage to pave a way for an appropriate treatment intervention.

Economic background

The economic impact of undermining healthy life expectancy is enormous. It has been suggested that knee joint damage has a major impact on a country's economy. A study by the American Academy of Orthopaedic Surgeons concluded that artificial knee joint replacement can save approximately 40,000 dollars in medical treatment costs, which brings the social benefit between 10,000 to 30,000 dollars¹⁾. According to the economists' survey, hip replacements in Japan can reduce eventual medical costs by more than 2.9 million yen²⁾. Research on direct and indirect costs for the treatment of end-stage knee osteoarthritis found that total knee replacement (or total knee arthroplasty (TKA)) is a very effective operation, and 90% of patients reported that they are pain-free, return to work, and have a significantly improved standard of living. The research also reveals that bone and joint disorders account for a number of workdays lost for 440 million workers per year, surpassing any other medical condition³⁾.

However, many of the joint conditions are chronic, progress relatively slow, and they are overlooked and viewed as part of the aging process. Restoration of worn-out joint cartilage to its original condition is difficult and such cartilage gradually deteriorates with age. If patients put up with pain over many years and postpone treatment, sarcopenia may develop. Then the innate mobility is undermined; loss in terms of social contribution is extremely large.

Approximately 3.5 million workers are taking care of their families, and every year over 100,000 of them leave their jobs to give care and nursing. Reducing the risk of dementia and long-term care can result in mitigating the risk to patients, their families, and people around them in regard to their social participation and economic activities.

Improving in-depth knowledge of the general public on knee and hip joints is an important agenda in a super-aging Japanese society. Information overload, a harmful effect of today's information society, makes it difficult to select reliable information. Against this backdrop, the AMDD's Orthopedic Committee has a duty to actively improve correct healthcare literacy for citizens, together with local governments and medical institutions.

Reference

- 1) <http://newsroom.aaos.org/media-resources/Press-releases/benefit-sofkneereplacement.htm#rel>
- 2) https://www.advamed.org/sites/default/files/resource/eiu_study_fi-nal_japanese.pdf
- 3) Burden of Musculoskeletal Disease, U.S. Bone and Joint Initiative, 2011