



Tailor made knee replacement improves accuracy & alignment in Chennai, India

A palm sized electronic device, 'I-Assist' was used to personalize and support knee replacement intra-operatively. Thanks to the new device, the orthopedic surgeon achieved accuracy and alignment to deliver a best possible fit during the surgery.

CHENNAI, India - Aug. 15, 2014 - [PRLog](#) -- Dr.A.K.Venkatachalam performed this procedure on two knees of a fifty five year old woman in Chennai for the first time.

The 'I-Assist' is a surgical guidance system designed to improve the accuracy of a total knee replacement. It assists the surgeon in aligning knee implants to each person's unique anatomy intra operatively. This provides a personalized fit and truly tailor-made total knee replacement. The outcome is very predictable as perfect alignment is achieved intra operatively. The implants themselves are not custom built.

The electronic smart tool incorporates latest guidance technologies into a half palm sized electronic display. Some of these technologies are also inbuilt in latest smart phones.

The surgeon can align and validate implant positioning during total knee replacement. As the device is anchored in the operating field itself, it doesn't require shifting of the surgeon's gaze. He doesn't have to remove his visual focus from the operating field. Earlier navigation systems require the back and forth transfer of the surgeon's gaze from the operating field to a computer monitor elsewhere several times intra-operatively.

The device integrates into the operation by requiring no complex imaging equipment and additional surgical incisions. It is compatible with the company's own product line of primary knee replacements.

History of navigation systems in total knee replacement

The goal of the surgeon during a total knee replacement is to get neutral alignment. So far the evidence favors a neutral alignment for long term survivorship. However, studies have shown that even experienced surgeons don't always achieve this perfection.

Hence computer navigation systems were introduced about a decade ago to achieve perfect alignment. In this system, pins were drilled in the thigh and leg bones away from the knee. These pins were attached to sensors. The sensors relayed information to a processor located elsewhere. The monitor of the processor displayed the accuracy of the bony cuts and bony alignment. Based on these, the surgeon could intra-operatively fine tune the cuts and positioning to get perfect alignment. As mentioned previously the surgeon had to shift his gaze back and forth from the operating field to the computer monitor located elsewhere. This computer navigation system also requires intensive capital investment.

A different approach toward this goal was adopted with '**Patient specific instruments (PSI)**'. This was pioneered by the author in Jan 2012 in Chennai. This required additional pre-operative imaging. The images were transferred electronically to engineers elsewhere. The engineers used Computer aided design to design and manufacture custom fit cutting tool for each patient. These patient specific instruments were shipped to the surgeon after an interval of a few weeks. Hence there is a time lag involved between the planning and execution in this process. Many patients don't want to wait.

The I Assist system improves on previous navigation technology.

The main component of the I-Assist knee guidance system is a **disposable** device that can be procured as needed. No capital equipment investment by the hospital is necessary. Its features are

- It is designed to intuitively integrate with surgeons' conventional instrumentation for total knee replacement.
- No pre-operative imaging is required.
- No wait time for the patient and the hospital
- Less invasive procedure to the patient.

It benefits everybody involved

- Unlike prior navigation technology or robotic surgery, the 'I-Assist' knee system saves surgeons more time.
- For hospitals it saves additional costs by eliminating pre-operative imaging.
- For the patient, it is less invasive.

Dr.Venkatachalam says that it is of great value primarily to young patients undergoing an uncomplicated primary total knee replacement. A sizeable number of young adults from Asia and Africa have additional problems in the leg that make the surgery more difficult. Additional bony deformities, resultant from previous accidents exist in the leg away from the knee. The use of conventional instruments that rely on bony normal alignment is impossible in these patients. It is vital to get perfect alignment as there is a positive correlation between accuracy and long term survivorship of the implant.

Dr.A.K.Venkatachalam specializes in joint replacements and key hole surgery.

For more information, visit **www.kneeindia.com**.

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