Transcutaneous bone-anchoring prosthesis with hip replacement: a novel treatment for amputees

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Background

Over the last two decades, Transcutaneous Bone-Anchored Prosthesis (TCBAP) has proven to be an effective alternative for prosthetic attachment for above knee amputees, particularly for individuals suffering from socket interface related complications. [1-17] Amputees with a very short femoral residuum (<15 cm) are at a considerable higher risk for these complications as well as high risk of implant failure, if they underwent a typical TCBAP due to the relatively small bony-implant contact leading to a need of a novel technique.

Aim

A. To describe the surgical procedure combining THR with TCBAP for the first time; and
B. To present preliminary data on potential risks and benefits with assessment of clinical and functional outcomes at follow up

Method

We used a TCBAP connected to the stem of a Total Hip Replacement (THR) prosthesis enabling the femoral residuum and the hip joint to act as weight sharing structures by transferring the load directly to the pelvis. We performed a tri-polar THR connected to a custom made TCBAP at the first stage followed by creating a skin implant interface as a second stage. We retrospectively reviewed three cases of transfemoral amputations presenting with extremely short femoral residuum. Patients were assessed clinically and functionally including standard measures of health-related quality of life, amputee mobility predictor tool, ambulation tests and actual activity level. Progress was monitored for 6-24 months.

Results

Clinical outcomes including adverse events show no major complications. Functional outcomes improved for all participants as early as 6 months follow up. All cases were wheelchair bound preoperatively (K0 – AMPRO) improved to walking with One stick (K3 – AMPRO) at 3 months follow up.

Discussion & Conclusion

THR and TCBAP were combined for the first time in this proof-of-concept case series. The preliminary outcomes indicated that this procedure is potentially a safe and effective alternative despite the theoretical increase in risk of ascending infection through the skin-implant interface to the external environment for this patient group. We suggest larger

comparative series to further validate these results.

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