AARHUS UNIVERSITY

Press release

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Basic information

Name: Rehne Hansen Email: RLHA@clin.au.dk Phone: 28128710

Department of: Clinical Medicine

Main supervisor: Kjeld Søballe

Title of dissertation: Osseointegrated implants for transfemoral amputees - Evaluation of migration, bone mineral density and bone turn-over markers

Date for defence: April 28th at (time of day): 13.30 Place: Auditorium 1, byg. 4a v/kantinen Aarhus Universitetshospital, Tage-Hansens Gade 2

Press release (Danish)

Osseointegrerede proteser til lårbensamputerede patienter - en undersøgelse af knoglemineraltæthed, protesestabilitet og knoglemetabolisme

OI protesekirurgi er et højt specialiseret behandlingstilbud til lårbensamputerede patienter, som har problemer med hylsterprotesen. osseointegration (OI) protesesystemet består af en knogleforankret protese (fixture) og en perkutan metalstang (abutment), som kobles til en ekstern benprotese via en kliklås.
Det overordnede formål med afhandlingen er at beskrive ændringerne i patienterne radiografisk og biokemisk indtil forsøgets afslutning eller OI protesefjernelse. Ændringerne blev målt ved brug af 3 metoder: dual energy x-ray absorptiometry (DXA), radiostereometrisk analyse (RSA) og knoglemarkører målt i serum.

Med DXA, har projektet belyst at knoglemineraltætheden reduceres omkring OI protesen hos patienter som senere fik fjernet protesen. Desuden var forhøjet type I kollagen (CTX) og forhøjet parathyreoideahormon (PTH) associeret med OI protesefjernelse.
Stabile proteser forblev in situ op til 5 år efter operationen, mens at kontinuerlig protese migration ind til 2 år medførte senere protesefjernelse.
I et randomiseret klinisk studie blev antiresorptiv behandling (denosumab) sammenlignet med placebo og tendensen var, at tabet i knoglemineraltæthed omkring OI protesen efter denosumab behandling var væsentligt reduceret sammenlignet med placebo.

Der er stadig meget at lære om de mekanismer, som fører til OI protesefjernelse. Resultaterne i denne afhandling finder vigtige prædiktorer, som er forbundet med protesefjernelse og kan være en hjælp for fremtidige studier rettet mod bedre OI protese overlevelsen.

Osseointegrerede proteser til lårbensamputerede patienter et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Rehne Hansen, der forsvarer det d. 28. april

Forsvaret af ph.d.-projektet er offentligt og finder sted den 28/04 kl. 13.30 i auditorium 1, bygning 4a, Aarhus Universitet, Tage-Hansensgade 2, 8000 Aarhus C.
Titlen på projektet er ”Osseointegrated implants for transfemoral amputees - "Evaluation of migration, bone mineral density and bone turn-over markers”.
Yderligere oplysninger: Læge, Ph.d.-studerende Rehne Lessmann Hansen, e-mail: RLHA@clin.au.dk, tlf. 78467471.

Press release (English)

AARHUS UNIVERSITY

Osseointegrated implants for transfemoral amputees -Evaluation of migration, bone mineral density and bone turnover markers

The osseointegration (OI) implant system is a highly-specialised treatment option for transfemoral amputees (TFAs) suffering from complications with the prosthetic socket. The system comprises a bone-anchored implant (fixture) in the residual femur connected to the external prosthetic leg via a percutaneous metal rod (abutment).
The overall aim of this thesis was to evaluate the radiographic and biochemical changes in TFAs with OI implants using three distinct methods: dual energy x-ray absorptiometry (DXA), radiostereometric analysis (RSA) and serum markers of bone turnover/metabolism.

We found that periprosthetic bone mineral density (BMD) decreased in patients with later OI implant removal. Furthermore, an increase in C-terminal telopeptide of type I collagen (CTX) and elevated parathyroid hormone (PTH) was associated with OI implant removal.
Using model-based RSA, we found that non-removed OI implants had a stable fixation, whereas later removed OI implants migrated continuously.
The effect of antiresorptive treatment with denosumab compared to placebo was examined in a randomised controlled design. The results indicated that patients treated with denosumab had less BMD loss adjacent to the implant compared to placebo.

There is still much to be learned about the mechanisms leading to OI implant loosening after surgery. The results of this thesis find important predictors associated with implant removal, and may inspire further studies towards improved OI implant survival.

The defence is public and takes place on April 28th at Auditorium 1, byg. 4a v/kantinen Aarhus Universitetshospital, Tage-Hansens Gade. The title of the project is "Osseointegrated implants for transfemoral amputees -Evaluation of migration, bone mineral density and bone turnover markers". For more information, please contact MD, PhD student Rehne Lessmann Hansen, email: RLHA@clin.au.dk, Phone +45 78467471

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