

# Dr Per-Ingvar Bränemark

## - The father of osseointegration...

Dentistry and our patients had the great fortune that Dr Bränemark stumbled inadvertently on the principle of osseointegration ...the stumbling may have been inadvertent but the genius was in the recognition and application of the discovery.

Per-Ingvar and his team at Gothenburg were in 1952 studying blood flow during healing and chose titanium to encase optical devices which were inserted into the tibia and fibula of rabbits. At the end of the project the researchers discovered to their surprise that the titanium had fused into the bone and could not be removed.

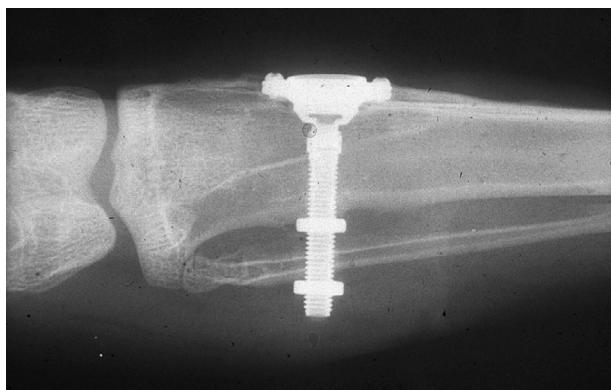
The immediate recognition of the potential of this discovery to provide an anchor for artificial teeth was followed by a protracted period of safety testing before Bränemark felt confident to introduce the technique to the world.

The dental world was, however, just not ready to accept challenges to the long-held belief that foreign bodies introduced into human tissue would always result in inflammation and probably rejection.

The tentious Dr Bränemark endured rejection of repeated applications for research grants... but at last the Swedish National Board of Health and Welfare in the 1970's approved the implants. By then the good doctor had accumulated considerable evidence including a patient who had for decades effectively relied on four mandibular implants to support his denture.

Experiments had also been carried out on human subjects ...some 20 laboratory researchers had implants inserted into their upper arms... some still bearing the scars!

It was at a meeting in Toronto in 1982 that a signal recognition was given to the discovery... osseointegration had finally arrived and of course since then millions of patients have benefitted from the technique.



Radiograph of Bränemark's initial rabbit specimen, showing the titanium optic chamber fixed to the rabbit's tibia and fibula.

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The profession acknowledged "the extensive and weighty documentation of implant efficacy" and "early replication by reliable independent researchers".

Whilst the concept became known as the Bränemark system, and was widely accepted, there have been other developers who have produced the specialised titanium or titanium-coated implants and today the option is readily available for numerous applications, for example to support external hearing aids, prosthetic ears and noses. Temporary anchorage using small titanium screws has taken over in many aspects of Orthodontics... patients happily accepting the technique in place of headgears and other cumbersome appliances.

South Africa was in fact one of the first countries to embrace osseointegration. Professors Slabbert and Lowrie from Wits travelled to Sweden to be "inducted into the clan" and returned to introduce the clinical procedures to the profession here.

Per-Ingvar Bränemark was ultimately recognised as the "father of osseointegration"... receiving the Swedish Engineering Academy medal for technical innovation and the coveted Swedish Society of Medicine Soederberg Prize in 1992... at the time of his death in 2014, he held more than thirty honorary positions at Universities through Europe and North America... and had been declared the European Inventor of the Year in 2011 in the category Lifetime Achievement.

### References

1. Per-Ingvar Bränemark. Wikipedia. ([https://en.wikipedia.org/wiki/Per-Ingvar\\_Bränemark](https://en.wikipedia.org/wiki/Per-Ingvar_Bränemark)).
2. <https://www.nytimes.com/2014/12/28/health/per-ingvar-branemark-dental-innovator-dies-at-85.html>.