

Novel conic cannula for spine cement injection

Novel conic cannula for homogeneous injection of bone cements in the spine have been patented and developed. The new design is especially indicated for the injection of ceramic-based bone cements because the pressure drop developed along the cannula minimizes bone cement's press filtering. Partners to further develop the technology and/or to establish commercial agreements along with technical cooperation are sought.

The Challenge

Injectable calcium phosphate cements find application as bone filling biomaterials to restore bone tissue damage in many clinical areas (dentistry, orthopaedics and traumatology). Unfortunately, these biomaterials, which should be minimally invasive injected through a cannula, suffer from press filtering due to the high pressure needed during the injection procedure. This results in inhomogeneous injection, incomplete filling of the bone cavity, lack of mechanical properties for the injected part of material, partial or total blocking of the cement into the cannula and very high hand-injection pressure. All these problems limit the clinical use of these biomaterials. The challenge is to minimize these problems as to extend the use of ceramic bone cements in the spine.

The Technology

The new conic cannula has been designed having in mind the influence of its geometry on both, the external pressure drop and the fluid flow velocity profiles established along its length. The new technology shows (when comparing to current double-length straight cannulas): a) a further reduction of the external pressure during the injection process; and b) continuous velocity profiles, which are optimum to minimize ceramic bone press filtering. The new conic cannulas can be easily manufactured.

Innovative advantages

- The new conic, instead of straight, cannula further reduced the external pressure needed to inject the bone cement.
- The new conic cannula developed continuous fluid flow velocity profiles along their length; these profiles are optimum to minimize ceramic bone press filtering.
- The new conic cannula expands the clinical use of calcium phosphates bone cements (dentistry, orthopaedics and traumatology, spine, bone tissue engineering, etc.).

Current stage of development

The computation results have been confirmed on several manufacture cannula prototypes.

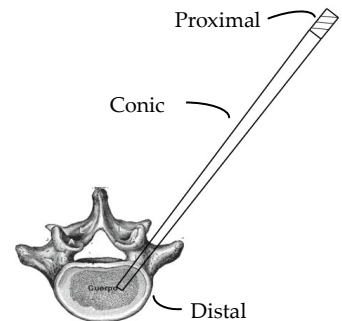
Applications and Target Market

Multiple possible applications are envisaged, all related to the homogeneous injection of slurry-like, semisolid and/or viscous materials. Several clinical target markets are possible: Dentistry, Orthopedics & Traumatology, etc. Manufacturing Medical Devices Companies should be interested (consumables).

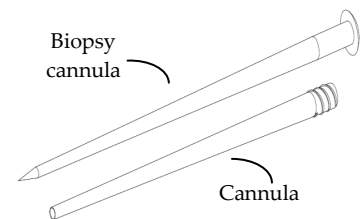
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The press filtering of ceramic bone cements is minimized and the external pressure is further reduced.



Bone cements can be further optimized under the new concept of conic cannula.

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

2 Priority patents application

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