BIOABSORBABLE PINS AND SCREWS IN ORTHOPAEDICS AND TRAUMATOLOGY, ESPECIALLY FOCUSING TO PEDIATRIC FIXATION

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1985
Bioscience Ltd. (Tampere, Finland) launched first in the world bioabsorbable pins for cancellous bone fracture fixation.

2012
More than 20 companies deliver worldwide bioabsorbable fixation devices for musculoskeletal applications. Bioretec Ltd. (Tampere, Finland) is one of such companies.
The ActivaPin™ is constructed of bioabsorbable lactic/glycolic acid copolymer (PLGA).

ActivaPin™ offers:
- Self-Locking SL™ technology with its patented grooved surface design.
- High Strength properties offers stabilized fixation, easy insertion and safe medical use.
- The bending modulus is closer to the value of cortical bone compared to metallic implants.
- It’s designed to gradually restore the original load carrying capacity of the bone.
- Bioabsorbable, eliminates the risk of long term complications and removal operations.
- Completely aseptic product handling in operation theatre thanks to advanced holder&instrument concept.

The ActivaPin™ maintains its intended function for at least 8 weeks. Complete bioabsorption takes place approximately within 2 years.

ActivaPin™
FDA permit to legally market July 6, 2006. K061164
CE approval February 12, 2007.
Manufacturing method and material composition of the ActivaPin™ creates high mechanical strength to the implant!
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**ActivaScrew™**

- **The ActivaScrew™** is constructed of bioabsorbable bioabsorbable lactic/glycolic acid copolymer (PLGA).
- ActivaScrew™ offers:
  - Auto-Compression™ technology with its patented mechanical activity.
  - The ActivaScrew™ is fully compatible with AO-instrumentation. The sizing of product range follows AO-school principle.
  - High Strength properties offers stabilized fixation, easy insertion and safe medical use.
  - The bending modulus is closer to the value of cortical bone compared to metallic implants.
  - It’s designed to gradually restore the original load carrying capacity of the bone.
  - Bioabsorbable, eliminates the risk of long term complications and removal operations.
  - Completely aseptic product handling in operation theatre thanks to advanced holder&instrument concept.
- The ActivaScrew™ maintains its intended function for at least 8 weeks. Complete bioabsorption takes place approximately within 2 years.
- ActivaScrew™
  - FDA permit to legally market November 22, 2006. K062980
PRECLINICAL EXPERIENCE – IN VIVO DEGRADATION

ActivaPin™ with diameters 1.5 mm and 2.0 mm can be used for fixation of physeal fractures, osteotomies, arthrodeses and osteochondral fractures in children, even if the pins must be driven through the growth plate, unless the area thus destroyed by the pin tracks exceeds 3 % of the total area of the growth plate (A.Mäkelä, Doctoral Thesis, Helsinki University, 1989).

Examples of possible indications:
Fractures of the lateral humeral condyle
Fractures of the medial condyle and the medial epicondyle of humerus
Shear fractures of capitellum
Fractures of distal radius
Fractures of radial head
Fractures of radial neck
Fractures of the phalanges
Fractures of metacarpals
Fractures of metatarsal bone
Fixation of osteochondritis dissecans fragments
Fractures of the medial malleolus

The effect of the ActivaPin™ upon the healing of growth plate has not been tested clinically.
FIXATION OF FRACTURE OF THE LATERAL HUMERAL CONDYLE
ActivaScrew™ with diameters 2.0 mm, 2.7 mm, 3.5 mm and 4.5 mm can be used for fixation of cancellous bone fractures and osteotomies, arthrodeses, bone grafts and osteochondral fractures in children. Alternatively ActivaScrew™ Cannulated with diameters 3.5 mm, 4.0 mm and 4.5 mm can be used.

Screws should not be driven through the growth plate.

Examples of possible indications:

- Talocalcaneal arthrodesis
- Distal tibial osteotomy
- Pelvic osteotomy in the treatment of congenital hip dysplasia
FIXATION OF DISTAL TIBIAL OSTEOTOMY
CLINICAL EXPERIENCE – FOREIGN BODY REACTIONS

- Clinically noticeable foreign body reactions with Bioretec products
  - Approx. 25 000 – 30 000 patients operated since autumn 2007
  - One reaction case suspected
Fixation of bimalleolar ankle fracture on lateral side with metallic hardware and on the medial side with two ActivaScrew™ 4.5 mm. Metallic hardware was removed at one year because of pain and irritation. (54 Year, female)
Implants that do more – It’s Bioretec

Thank you for your interest!