Commercial presentation

3D custom-made implants
AnatomikModeling is the result of 10 years of research and development with Toulouse University Hospital, to develop a particularly innovative computer-aided design (CAD) technology for 3D custom-made implants, as well as a mini-invasive surgical method to implant them.

Sebbin has been manufacturing and marketing implants, particularly breast implants, for plastic and reconstructive surgery all over the world for 30 years.

AnatomikModeling and Sebbin partnered to develop an innovative product and market this new solution in Europe.

Design through computer-aided designing (CAD) and manufacturing of silicone custom-made implants. These implants are perfectly fitting each patient’s anatomy to compensate for a congenital deformity or trauma.

Medical care of pathologies such as Pectus Excavatum (funnel chest), Poland syndrome (complete or partial absence of the pectoralis muscle) or other muscle deficiency (calf atrophy).
PATHOLOGIES

Pectus Excavatum

- Malformation of the thorax characterised by a median or lateral depression of the sternum.
- Pectus Excavatum occurs in 1 to 2% of the population. This is the most common congenital thoracic deformity with an incidence of 1 in 300 births. 1 woman for 5 men.
- Only 15% of those with a Pectus Excavatum are being operated on.
- Very rare functional impact, but strong psychological one.
- Pectus often affects the breast shape in women: high and low convergence, and asymmetry.
Poland Syndrome

- Complete or partial absence of the pectoral muscle. Poland cases are thus very different from one to another.
- 1 case out of 30000 births. Can be associated with a malformation of the ipsilateral hand.
- The defect often takes the form of a depression under the clavicle and in women by a breast asymmetry.
- Can be associated with a deformation of the rib cage.
Muscle deficiency

- Congenital or acquired muscular hypotrophy or agenesis: calf atrophy in particular
- Talipes equinovarus, sequelae of polyomyelitis, degenerative diseases, traumatic and/or surgical sequelae
Design

- Creation of a 3D virtual copy of each patient’s body from hospital patient CT scan with millimetric precision (1 to 1,2)
- 3D reconstruction requiring complex mathematical algorithms for medical imaging processing.
- Segmentation of each tissue: bones, muscles, skin, cartilages
- Design of the virtual implant on each patient’s 3D digital body: based on 2 planes (anterior anatomical plane and posterior surgical plane.
- Control and optimisation of the result with the direct participation of the surgeon in charge.
Manufacturing

- Manufacturing of an Elastomer Prototype to get a perfect silicone anatomical copy, which will be the future implant.
- Manufacturing of a mould from the prototype.
- Casting of the medical polymerised silicone also called silicone rubber (long-life implant, no risk of rupture).
- Quality control, sterilisation, identification (serial number and patient codification), packaging and shipping to the relevant hospital or clinic.
Surgery

- Surgery under general anaesthesia, around 1 hour.
- 3-day hospitalisation maximum
- 7 cm vertical median incision, preparation of the locus to the size of the implant. Implant deeply placed into the locus under the muscle. Closing in 3 planes.

Surgical Outcomes

- Surgical outcomes with little pain: simple analgesics.
- Little post-operative care: resorbable stitches, no drain, a dressing for only 8 days and a compression bra to wear from discharge for 1 month.
- Follow-up consultation after 8 days with possible puncture of seroma
- Sick leave for 15 days and sports restriction for 3 months.
3D custom-made implant

- Fit perfectly to each patient anatomy, refined aesthetic result, invisible implant.
- Easy setting up of the implant, excellent stability
- Comfort due to material's flexibility and smooth implant's edges
- Simple surgery: only one surgery of 1 hour, 3-day hospitalisation maximum
- Good post-operative outcomes, with mild pain (analgesics during 15 days), control after 8 days
- Rapid resumption of activity (15 days to work and 3 months for sport)
- Low risk of complications, no manipulation of ribs

Nuss procedure

- Risk of malformation persists after bar removal
- Risk of bar displacement (urgent additional surgery)
- 2 surgeries of 2 hours, 7-day hospitalisation
- Pain treated with epidural during 4 days and analgesics during minimum 1 month, physiotherapy sessions during 1 or 2 months
- Back to normal activity after 1 month and sport after 3 months (progressive, contact sports prohibited)
- Risks of lesions and complications: pneumothorax, pericarditis, bar displacement, heart and lung damage, hematoma…
POLAND SYNDROME RESULTS
GLOBAL PROCESS

Consultation / scan
Send patient data/ scan (CD) + prescription to Sebbin
Validate data and feasibility
Send quotation to surgeon
Confirm quotation to Sebbin
Launch design, send specifications to surgeon
Validate design to AnatomikModeling
Manufacture prototype
Manufacture mould
Manufacture by cast of silicone / package implant
Send implant to sterilisation
Receive implant and prototype in hospital
Perform surgery

2 months needed from the quotation confirmation and half of the payment to implant delivery

Surgeon
AnatomikModeling
Sebbin

GLOBAL PROCESS

20/04/2016

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**Chirurgie des malformations congénitales et techniques de reconstructions assistées par l’informatique.**

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**Management of breast asymmetry associated with primary funnel chest**


**Mammary implant selection or chest implants fabrication with computer help;**

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**Pectus excavatum : correction par la technique de comblement avec mise en place d’une prothèse en silicone sur mesure en position rétromusculaire profonde**

Chavoin JP, Dahan M, Grolleau JL, Soubirac L, Wagner A, Foucras L, Darbas D, Pomar P.

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**Chirurgie des malformations du thorax.**

Umuroglu T, Bostanci K, Thomas DT, Yuksel M, Gogus FY.

**Perioperative anesthetic and surgical complications of the Nuss procedure.**

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Malek MH, Berger DE, Marelich WD, Coburn JW, Beck TW, Housh TJ.

**Pulmonary function following surgical repair of pectus excavatum: a meta-analysis.**


**Syndrome de Poland.**
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