

Pectus Excavatum and Poland Syndrome Surgery

Custom-Made Silicone Implants by
Computer Aided Design

Jean-Pierre Chavoïn
Editor

 Springer

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Pectus excavatum is the most common thoracic deformity with an incidence of 1/300 to 1/1000 births. In the absence of cardiac or respiratory impairment, the condition is a mere morphological deformation. The CAD silicone implant procedure allows very good aesthetical results in only one operative time and retained throughout the life time. It minimizes risk and pain compared to other remodelling surgical techniques, more invasive.

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[Chap 1. Thoracic Malformations: Etiopathogeny, Genetic, and Associated Syndromes](#)

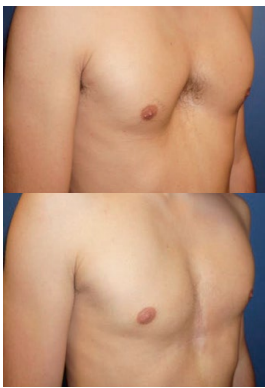
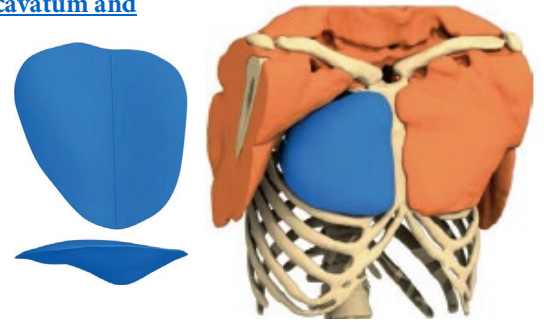
Benoit Chaput, Alexane Laguerre, and Jean-Pierre Chavoïn

Authors review embryological and genetic hypotheses on Pectus families and Poland syndrome. They wonder about different associations together or with fibrous disease as Tuberous breasts. Embryological insufficiency of vascular perfusion vascular is mentioned.

[Chap 2. Computer-Aided Design: Prototyping and Manufacturing \(Pectus Excavatum and Poland Syndrome\)](#)

Benjamin Moreno, Pierre Leyx, and Jean-Pierre Chavoïn

Computer-aided design (CAD) allows to create implants that fit perfectly each patient anatomy. We explain in this chapter the different steps to manufacture a custom made silicone implant: data acquisition, segmentation, design, prototyping and silicone casting.



[Chap 3. Pectus Excavatum Remodelling by CAD Custom-Made Silicone Implant: Experience of 600 Cases](#)

Jean-Pierre Chavoïn, Marcel Dahan, Benjamin Moreno, Jean-Louis Grolleau, and Benoit Chaput

Authors present a 600 cases experience of Pectus Excavatum without functional context treated with custom made implants. Surgical procedure and outcomes are detailed. They highlight simplicity and good aesthetic results especially in deep and asymmetric cases. Furthermore security context is good for patients.

[Chap 4. Poland Syndrome Remodeling by CAD Silicone Custom-Made Implants](#)

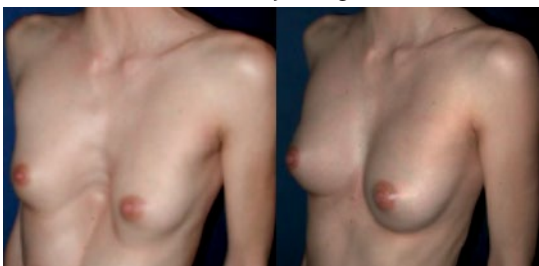
Jean-Pierre Chavoïn, Mohcine Taizou, Benjamin Moreno, Jean-Louis Grolleau, and Benoit Chaput

The CAD custom made implant's procedure is quicker and better adapted than latissimus flap and lipostructure®. They correct accurately the lack of muscle and associated atrophies. The authors describe their procedure after an experience of 138 cases operated on.

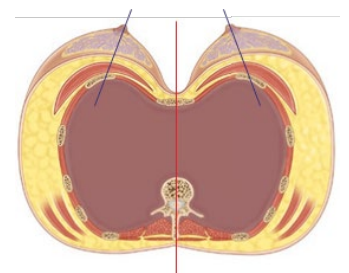


[Chap 5. Breasts and Pectus Excavatum](#)

Jean-Pierre Chavoïn, Mary Morgan, Richard Vaucher, Benjamin Moreno, Benoit Chaput, and Jean-Louis Grolleau



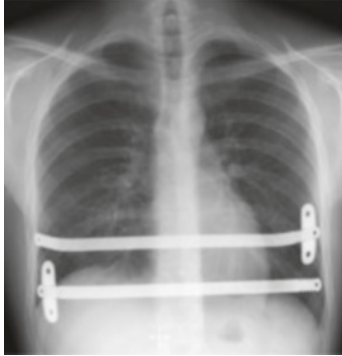
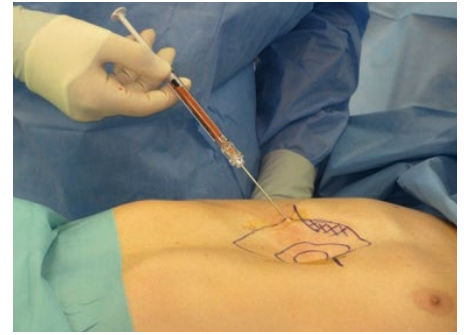
Pectus excavatum involves breast's deformation on women with asymmetry, convergence or divergence that are not well corrected in case of hypotrophy by classical gel implants. The pectus has to be treated first then, if needed, breast's implants should be used in a second procedure but in a pre-muscular position.



[Chap 6. Filling Method with Fat Graft Technique in Pectus Excavatum and Poland Syndrome](#)

Christian Herlin

Fat graft filling procedure may be an alternative for patients having mild pectus or Poland syndrome. Lipofilling can also improve the results of Poland Syndrome cases, after the use of a custom-made implant.



[Chap 7. Thoracic Surgical Correction of Pectus Excavatum: Minimal and Open Approaches](#)

Ian Hunt and Stephanie Fraser

Surgical correction of chest wall deformity through Nuss or Ravitch procedure remains an important option. Based on a recent review and meta-analysis, this chapter makes a comparison of both procedures for paediatrics and adults patients, as concerns operation duration and hospital stay, post-operative pain or complications.

[Chap 8. Pectus Excavatum: Functional Respiratory Impact, Quality of Life, and Preoperative Assessment](#)

Louis Daussy, Elise Noel-Savina, Alain Didier, and Daniel Riviere

PE respiratory impact is discussed. Until now, there is no consensus despite many publications. In this chapter, authors tried to make a state of knowledge about the impact of Pectus, both on the physiology and on the health-related quality of life.

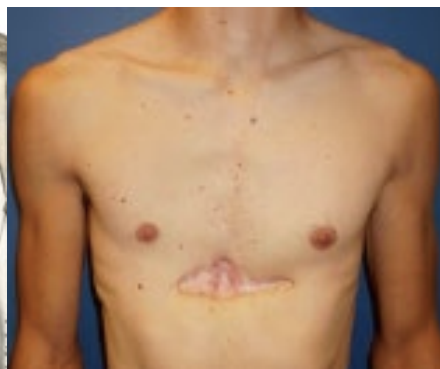
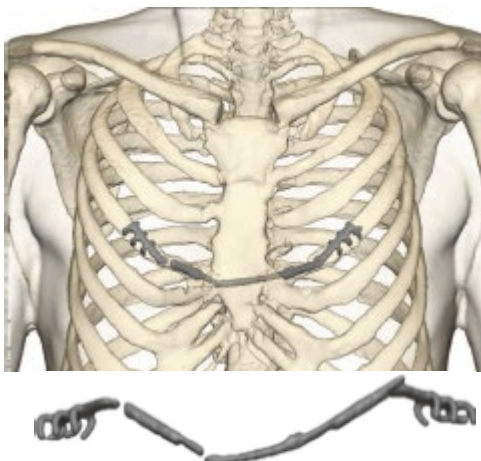
[Chap 9. The Cardiorespiratory Implications of Pectus Excavatum](#)

Samir S. Shah and Pankaj Kumar Mishra

There are many papers on cardiopulmonary sequelae of Pectus Excavatum, but the true relevance of the findings remains to be clearly delineated. In particular due to the absence of true long-term follow-up and randomized controlled trial.

[Chap 10. Complications and Hazards with Pectus Excavatum Surgeries: Secondary Surgical Procedures with Implants](#)

Françoise Le Pimpec Barthes, Ian Hunt, Samir S. Shah, Antonio Messineo, Louis Daussy, Aymeric André, Marcel Dahan, and Jean-Pierre Chavoïn



This chapter is based on the analysis of the literature and the experience of thoracic, paediatric, and plastic surgeons. It details the risks of complications associated to orthopaedic remodelling of the thorax (Nuss or Ravitch), like scar's sequelae, bar migration or fracture, infection, pneumothorax, heart perforation...