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Habilitation Thesis

ABSTRACT

BARIATRIC AND METABOLIC SURGERY: A Safe and Efficient Therapeutic Option for the Long-Term Control of Obesity in Romania

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HABILITATION THESIS — ABSTRACT
BARIATRIC AND METABOLIC SURGERY:
A Safe and Efficient Therapeutic Option for the Long-Term Control of Obesity in Romania

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Background and Scientific Context

This Habilitation Thesis focusses on my involvement and contribution to the complex problem of Obesity and bariatric surgery. As I realized its therapeutic importance and its urgent need to be introduced, developed and extended in Romania, my interest to this topic arose before presenting the final conclusions of my PhD research — *The Laparoscopic Treatment for Gastro-Esophageal Reflux Disease*, dedicated to the introduction and development of modern surgical therapies for GERD — and ran initially in parallel before 2009.

Obesity has reached pandemic proportions globally, affecting more than one billion adults and driving an epidemic of type 2 diabetes (T2DM), cardiovascular disease, cancer, and disability. In Romania, approximately four million adults are obese, yet systematic public access to evidence-based treatment remains limited. Bariatric and metabolic surgery (BMS) has emerged as the most effective and durable therapeutic intervention for morbid obesity and its metabolic consequences — but its introduction to Romania and Eastern Europe required deliberate scientific leadership, institutional infrastructure, and two decades of continuous clinical and research effort.

This habilitation thesis presents that effort: a body of original publications, technical innovations, clinical guidelines, and institutional achievements, anchored in an institutional experience of more than 12,000 laparoscopic bariatric procedures performed at the first and, for many years, only internationally accredited Bariatric Center of Excellence in Romania and Eastern Europe.

Thesis Structure

The thesis consists of nine Chapters, and it is organized around eight thematic contributions, each documented by original peer-reviewed publications, book chapters, or international guidelines:

- ▶ **Chapter 1 — Introduction:** Epidemiological context, history of bariatric surgery internationally and in Romania, scientific rationale, quality accreditation framework (IFSO-EC and SRC Centers of Excellence), and definitions.
 - ▶ **Chapter 2 — Procedural Introduction:** Seven publications documenting the systematic introduction of the full spectrum of laparoscopic bariatric procedures to Romania (2004–2018), with the first
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comprehensive Romanian-language technical description of all bariatric surgery procedures (Angelescu textbook, 2010).

- ▶ **Chapter 3 — Multi-Dimensional Effects:** Ten publications on metabolic syndrome, glycemic metabolism, cardiovascular risk, reproductive endocrinology, gut microbiota, Ghrelin neuroendocrinology, oncological risk, and adolescent outcomes.
- ▶ **Chapter 4 — Complication Prevention and Management:** Eight publications on postoperative hemorrhage, symptomatic stenosis, gastric fistula, portal vein thrombosis, and anaesthetic safety — drawing on prospectively monitored series of thousands of patients.
- ▶ **Chapter 5 — Long-Term Outcomes and Revisional Surgery:** LSG long-term outcomes (Springer reference chapter) and re-sleeve gastrectomy (three-year institutional series).
- ▶ **Chapter 6 — GERD, Hiatal Hernia, and the R-PEL Technique:** Six publications from a longitudinal research program on GERD epidemiology, intraoperative hiatal hernia characterization, experimental cruroplasty reinforcement, and the original R-PEL technique.
- ▶ **Chapter 7 — CREDOR RCT and Translational Research:** The only Romanian RCT in bariatric surgery (MEN-UEFISCDI funded), its translational follow-up publications, and a health economics analysis for Romania.
- ▶ **Chapter 8 — International Contributions and Leadership:** Co-authorship of EAES 2020 and 2022 guidelines, IFSO-EC multimodal meta-analysis 2025, World Obesity Delphi consensus 2025, IFSO Global Survey, Extreme Obesity Delphi, GENEVA COVID-19 cohort study, national registry of bariatric surgery procedures, subspecialty recognition, training, and international organizational leadership.
- ▶ **Chapter 9 — Conclusions and perspectives for future research.**

Chapter 2 — Introduction of Bariatric Procedures to Romania: A Complete Therapeutic Armamentarium

Each major laparoscopic bariatric procedure was introduced to Romania for the first time by the author, documented prospectively, and published in the national peer-reviewed literature: the Mini-Gastric Bypass (2004, n=7, BMI 52.7–71.9 kg/m²); Laparoscopic Adjustable Gastric Banding (2007, first performed January 2002, the first in Eastern Europe); Laparoscopic Sleeve Gastrectomy (2009, n=340, EWL 66% at 12 months, zero mortality); Laparoscopic Gastric Plication (2011, n=22, EWL 48% at 6 months); Roux-en-Y Gastric Bypass (2012, T2DM remission 78%); and Biliopancreatic Diversion with Duodenal Switch (2018, n=56, 16-year experience, excess BMI loss 82% at 62 months, T2DM remission 92%).

In 2010, the author published the first comprehensive illustrated description of all bariatric surgical techniques in Romanian-language surgical literature — Chapter 11 of the Angelescu/Popa "Caiete de Tehnici Chirurgicale", Vol. 2, accompanied by original surgical illustrations — creating the foundational

technical reference for Romanian surgeons at other centers. Together, these seven publications and the textbook chapter document the deliberate, evidence-generating construction of a complete bariatric therapeutic armamentarium over sixteen years.

Chapter 3 — Multi-Dimensional Effects of Bariatric and Metabolic Surgery

Ten publications document the clinical effects of BMS beyond weight loss across a decade of systematic investigation:

- ▶ Metabolic syndrome prevalence fell from 74.3% to 18.4% at 6 months post-LSG (n=124, p<0.001); EWL was the only independent predictor of remission.
- ▶ Glycaemic improvement was documented at postoperative day 10 — before significant weight loss — confirming weight-independent metabolic mechanisms (n=60 prospective).
- ▶ 10-year Framingham CHD risk fell by 78% within 12 months of LSG; mean vascular age normalized from 65.6 to 40.7 years — statistically indistinguishable from chronological age (n=47).
- ▶ Aortic distensibility improved by 110%, LV hypertrophy prevalence fell from 61.8% to 32.3%, and LV diastolic dysfunction from 52.9% to 23.5% at 12 months (Obesity Surgery, 2014 — first international report on LSG and arterial elasticity).
- ▶ Total testosterone rose by 53% following LSG in obese males, reaching the normal range; metabolic syndrome fell from 75% to 25% (n=28).
- ▶ BMS induces a clinically meaningful shift in gut microbiota towards a metabolically more favorable profile, with implications for probiotic supplementation strategies (systematic review, *Nutrients*, 2020).
- ▶ Acylated ghrelin suppressed by 80% at 3 months post-LSG versus 28% after gastric plication, providing mechanistic support for LSG's superior appetite control.
- ▶ Premalignant endometrial pathology regressed in 4/6 postmenopausal patients after bariatric surgery (first Romanian clinical evidence on this relationship).
- ▶ In sixty-four adolescent patients (mean age 15 years), LSG achieved mean BMI of 22.7 kg/m² at 36 months with no major complications, supporting early surgical referral in appropriately selected adolescents.

Chapter 4 — Prevention and Management of Complications

The largest contributions in this chapter draw on the prospectively maintained Bariatric Outcomes Longitudinal Database (BOLD) at Ponderas Academic Hospital, mandatory since SRC accreditation (2014):

- ▶ **Postoperative hemorrhage (n=4,996):** Systematic over-sewing of the stapled line combined with the original Protocol for Prevention of Postoperative Hemorrhage (PPHP) — in which blood pressure is raised intraoperatively to 30% above baseline to reveal latent bleeding — reduced total bleeding requiring reoperation from 0.8% to 0.38% ($p=0.033$) and eliminated stapled-line bleeding entirely ($p=0.002$). Zero mortality in both groups.
- ▶ **Novel ICG fluorescence technique:** World-first application of laparoscopic retrograde ICG wash-out mapping to localize obscure gastrointestinal hemorrhage, successfully applied in two cases including a post-RYGB patient with bleeding undetectable by conventional means.
- ▶ **Symptomatic stenosis (n=4,304 and n=5,235):** Two publications document a protocol-driven reduction in functional stenosis incidence from 2.1% to 0.3% over 7 years; endoscopic pneumatic dilation achieved 100% success for functional stenosis and 86% for organic stenosis. A modified prepancreatic fascia fixation technique reduced functional stenosis OR to 0.38 ($p=0.03$).
- ▶ **Gastric fistula — LRYFJ:** First published application of laparoscopic Roux-en-Y feeding jejunostomy for persistent sleeve fistulas ($n=6$), offering critical advantages over naso-jejunal tubes and loop jejunostomy.
- ▶ **Portal vein thrombosis (n=5,154, 8 years):** Incidence 0.077%; updated prevention protocol with 4-week LMWH, Anti-Xa monitoring, and selective thrombophilia screening. One fatal case illustrated the catastrophic risk of delayed diagnosis.
- ▶ **Anaesthetic safety:** First clinical evaluation of the Infrared Intubation System (IRRIS) in 20 bariatric patients, providing real-time independent tracheal confirmation as an adjunct to video laryngoscopy.

Chapter 5 — Long-Term Outcomes and Revisional Surgery

A chapter contributed to the Springer reference work *Obesity, Bariatric and Metabolic Surgery* (2nd edition, 2023) synthesizes the international evidence for LSG weight loss outcomes, arguing that "evolved" LSG — with standardized 35–36 Fr bougie, complete posterior adhesiolysis, and systematic staple-line reinforcement — delivers medium-term weight loss comparable to RYGB. Revisability of LSG to RYGB, OAGB, or BPD-DS is identified as a defining advantage of the procedure's place in a sequential surgical strategy for chronic obesity.

Re-sleeve gastrectomy for weight regain after primary LSG ($n=27$, 3-year follow-up, *Chirurgia* 2019) achieved meaningful additional EWL with an acceptable safety profile. Mean BMI fell from 35.0 to 27.2 kg/m^2 at 3 years; EWL% was 85% at 3 years. The series has been cited in multiple international systematic reviews and in the Springer revisional surgery reference chapter.

Chapter 6 — GERD, Hiatal Hernia, and the Original R-PEL Technique

The chapter's scientific arc moves from national reference synthesis (2017 book chapter in the *Tratat de Patologie și Chirurgie Esofagiană*, Romanian Academy), through epidemiology, intraoperative characterization, experimental biology, and clinical innovation:

- ▶ **GERD epidemiology (n=448, prospective):** Hiatal hernia identified in 26.56% by endoscopy; 62% of patients with endoscopic esophagitis were completely asymptomatic — confirming that symptom-based screening misses the majority of affected bariatric candidates and supporting mandatory preoperative endoscopy.
- ▶ **Intraoperative hiatal hernia (prospective series):** Intraoperative inspection during LSG revealed hiatal hernia frequency exceeding preoperative assessment rates, establishing the rationale for systematic active search and concomitant repair during every sleeve gastrectomy.
- ▶ **Experimental reinforcement model:** International collaborative porcine study (n=14 pigs) demonstrated that both Bio-A® absorbable mesh and autologous PRP induce collagen remodeling and neovascularization in the crural area; PRP showed more active myofibroblast recruitment — supporting its application as a cost-neutral, foreign-body-free crural adjunct.
- ▶ **R-PEL Technique (n=273, prospective, Surgical Endoscopy 2023):** The Reconstruction of the Phreno-Esophageal Ligament technique addresses the anatomical root cause of intrathoracic gastric migration — disruption of the phreno-esophageal membrane during hiatal dissection — rather than merely restoring hiatal dimensions. Standard cruroplasty alone led to intrathoracic migration in >50% of patients at 12 months; R-PEL reduced this rate sevenfold (to 8.7%), with severe de novo esophagitis 4.3× less frequent. Zero technique-related complications. More than twenty international citations; 4,209 article accesses since January 2023.

Chapter 7 — The CREDOR RCT and Translational Research

The CREDOR (Controlled Romanian Diabetes and Obesity Research) study is the only Romanian RCT in bariatric and metabolic surgery, funded by the competitive MEN-UEFISCDI grant PN-II-PT-PCCA-2013-4-2154. The author was sole operating surgeon (all 20 LSG procedures at Ponderas Academic Hospital) and principal clinical investigator.

- ▶ **Primary RCT results (Rev Chem, 2017):** 41 obese males with T2DM randomized; surgical arm achieved 78.98% EWL versus 9.45% conservative (n=19 vs 15 evaluable at 12 months). At V3, 17/19 surgical patients had discontinued all antidiabetic pharmacotherapy; 0/19 conservative patients achieved medication discontinuation. HOMA-IR fell markedly; adiponectin normalized; ghrelin suppressed by 28% in the surgical arm versus a paradoxical 40% rise in the conservative arm — mechanistically explaining the inferiority of dietary restriction for long-term weight control.
 - ▶ **Inflammatory and oxidative stress (Metabolites, 2020):** HbA1c improvement 89% surgical vs 14% conservative; incretin hormones normalized; chronic inflammatory and oxidative phenotype of
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diabesity reversed at the molecular level. Duration of T2DM identified as the critical predictor of remission.

- ▶ **6-month oxidative stress (Farmacia, 2019):** Reversal of oxidative stress established by 6 months, before completion of weight loss trajectory — confirming weight-independent anti-inflammatory mechanisms.
- ▶ **T2DM remission biomarkers (J Clin Mol Med, 2020):** Proinsulin/insulin ratio and visceral fat % identified as novel predictors of T2DM remission — providing a biologically grounded patient selection framework beyond BMI criteria.
- ▶ **Health economics (Frontiers in Nutrition, 2025):** First Romanian health economic analysis of metabolic surgery for T2DM; favorable cost-effectiveness ratio demonstrated, supporting the case for public reimbursement — directly relevant to RSMS policy advocacy.

Chapter 8 — International Guidelines, National Leadership, Training, and Scientific Leadership

International Guideline Co-Authorship:

- ▶ **EAES Clinical Practice Guidelines on Bariatric Surgery (Surgical Endoscopy, 2020):** 36,000 accesses, 427 citations, Altmetric 72. Co-endorsed by EAES, IFSO-EC, EASO, ESPCOP. 42 clinical questions, 36 recommendations. Several recommendations directly reflect institutional publications including mandatory preoperative endoscopy and hiatal hernia repair policy.
- ▶ **EAES Rapid Guideline (Surgical Endoscopy, 2022):** Network meta-analysis of 24 RCTs; GRADE-based recommendations establishing LSG and RYGB as preferred procedures.
- ▶ **IFSO-EC Multimodal Strategies Meta-Analysis (Diabetes, Obesity and Metabolism, 2025):** 25-member IFSO-EC expert panel; systematic review and GRADE-based recommendations on combining surgery with pharmacological and endobariatric approaches.
- ▶ **World Obesity Delphi Consensus (Clinical Obesity, 2025):** 45 global experts, 169 statements, 90 with consensus. Recognized by Wiley with a "Top cited article 2025" certificate — sole Romanian participant.
- ▶ **IFSO Worldwide Survey 2020–2021 (Obesity Surgery, 2024):** National representative for Romania/RSMS in the definitive global bariatric epidemiology report; first documentation of COVID-19 pandemic impact on global BMS activity.
- ▶ **Extreme Obesity Delphi — BMI >60 (Obesity Surgery, 2024):** 36-member global expert panel; consensus on procedural selection and perioperative management for super-super-obese patients.
- ▶ **GENEVA COVID-19 Cohort (Obesity Surgery, 2021):** 7,704 patients, 42 countries; 30-day morbidity 6.76%, mortality 0.14%, confirming safety of BMS during the pandemic; Ponderas Academic Hospital as contributing center.

National Leadership and Institutional Achievements:

- ▶ First IFSO-EC/SRC doubly accredited Bariatric Center of Excellence in Romania and Eastern Europe (2011/2014), maintained through triennial audits to present; Ponderas Academic Hospital currently holds 7 SRC Centers of Excellence. Author designated SRC Master Surgeon in Metabolic & Bariatric, Colorectal, and Hernia Surgery.
- ▶ Founding and Presidency of the Romanian Society for Metabolic Surgery (RSMS); launch of the National Bariatric Surgery Registry (2022); publication of the first Romanian national clinical guidelines for bariatric surgery.
- ▶ RO-OS 2024 National Obesity Prevalence Study (n=1,115): approximately 4 million Romanians are obese — first nationally representative epidemiological survey.
- ▶ Executive Director of the Bucharest Surgical Training Institute (endorsed by RAES, EAES, ASMBS) since 2011; >2,000 surgeons certified; 12–15 international hands-on courses per year; Expert Trainer for Eastern Europe and Middle East; Invited Faculty at IRCAD (Strasbourg) since 2017.
- ▶ International Symposium of Bariatric and Metabolic Surgery, Bucharest — annual IFSO-endorsed scientific forum since 2008, now in its 16th edition (2024), 78 speakers, 12 countries.
- ▶ EAES Education and Training Committee (2011–2015); IFSO-EC Education and Training Committee (2016–2022); IFSO-EC Communication Committee (2014–2021); IFSO-EC Treasurer (2022); IFSO-EC Executive Council (2023); IFSO-EC President-Elect (2025); IFSO Global Executive Council (2025); IFSO-EC Congress President, Bucharest 2028.

Principal Conclusions

- ▶ The complete spectrum of laparoscopic bariatric and metabolic surgical procedures has been introduced to Romania through an active contribution, evidence-generating program — each procedure first-performed, proctored, prospectively documented, and published — establishing an institutional platform of >12,000 procedures with internationally benchmarked outcomes.
 - ▶ Bariatric and metabolic surgery produces clinically significant, durable, and multi-dimensional health benefits: metabolic syndrome resolution >75% at 6 months; 10-year cardiovascular risk reduction 78%; vascular age normalization within 1 year; T2DM remission 78–92% depending on procedure; testosterone normalization in obese males; premalignant endometrial regression; safe and effective outcomes in adolescents.
 - ▶ A comprehensive institutional safety framework — encompassing the PPHP hemostasis protocol, the stenosis prevention protocol, the PVT management algorithm, and novel original techniques (ICG bleeding mapping, LRYFJ) has produced safety outcomes that meet or exceed international Center of Excellence benchmarks in large series of patients.
 - ▶ Gastro-esophageal reflux disease is underestimated by symptom-based screening in the bariatric population (62% of esophagitis asymptomatic); conventional cruroplasty fails to prevent
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intrathoracic gastric migration in >50% of patients; the R-PEL technique reduces this rate sevenfold (to 8.7%) — the world's largest prospective R-PEL series (n=273, *Surgical Endoscopy* 2023, 20 citations).

- ▶ The CREDOR RCT provides Level 1 evidence for LSG superiority over conservative management in Romanian obese T2DM patients, with near-complete antidiabetic medication discontinuation in the surgical arm (89% vs 0%); translational follow-up publications characterize the molecular mechanisms and identify novel remission predictors.
- ▶ Co-authorship of four international guideline or consensus documents (EAES 2020/2022, IFSO-EC 2025, World Obesity 2025) confirms that the evidence generated by this program has contributed to shaping clinical standards across Europe. The EAES 2020 guidelines have attracted 427 citations and 36,000 accesses.
- ▶ The author serves as IFSO-EC President-Elect (2025) and IFSO Global Executive Council member — the first Romanian surgeon to reach this position — and as Congress President of the IFSO-EC Annual Conference, Bucharest 2028, providing the platform to advocate for systematic public reimbursement of bariatric surgery in Romania and Eastern Europe.
- ▶ The training and credentialing infrastructure established through the *Atestat CBM* will require ongoing academic oversight to ensure that Romanian bariatric surgery training standards evolve in parallel with international practice — a responsibility that falls naturally to my role on the IFSO-EC Executive Board.
- ▶ The evolution of the relationship between bariatric surgery and pharmacological obesity management — particularly the new generation of GLP-1/GIP receptor agonists — will require prospective investigation of the comparative, complementary, and sequential roles of surgical and pharmacological approaches.
- ▶ Bariatric and metabolic surgery is a safe and efficient therapeutic option for the long-term control of obesity in Romania but extended institutional support as well further research for the best therapeutical strategy is paramount.

Sleeve gastrectomy · gastric bypass · biliopancreatic diversion · obesity · type 2 diabetes · metabolic surgery · GERD · R-PEL technique · Center of Excellence · Romania · CREDOR RCT · RSMS RO-OS, RSMS guidelines, IFSO guidelines.
