HISTORICAL CORNER (English version)

Beginnings of bariatric and metabolic surgery in Spain

Inicios de la cirugía bariátrica y metabólica en España

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Abstract
Bariatric surgery (BS) from the Greek *bari* = weight and *iatrein* = cure) treats obesity and began in Spain in 1973. Its greatest development occurs after the founding of SECO (Spanish Society of Obesity Surgery) in 1997. The purpose of this work is to reflect the changes that have occurred in these 22 years.

Keywords
Morbid obesity; Bariatric surgery; SECO

Resumen
La cirugía bariátrica (CB) de *bari* = peso y *iatrein* = cura) trata la obesidad y comienza en España en 1973. Su mayor desarrollo ocurre tras la fundación de SECO (Sociedad Española de Cirugía de la obesidad) en 1997. La finalidad de este trabajo es reflejar los cambios que han ocurrido en éstos 42 años.
Obesity is a multifactorial epidemic ailment of environmental origin, affecting subjects from all countries, and whose origins are not in the stomach or intestine. It represents a unique case of surgery to operate healthy organs, which are not the cause of the disease and do not improve after the operation.

Obesity is a multifactorial epidemic ailment of environmental origin, affecting subjects from all countries, and whose origins are not in the stomach or intestine. It represents a unique case of surgery to operate healthy organs, which are not the cause of the disease and do not improve after the operation. Payne and Scott developed these ID techniques in the 1960s leaving only 14-4 inches (35-10 cm) as an absorptive zone and those were abandoned in the 1970s because of their serious metabolic (malnutrition) and hepatic (liver failure) complications.

Buchwald initiated the ID of the last third of the intestine for hypercholesterinemia (POSCH) and showed its protective role at 25 years in the development of atherosclerosis. Now it has also been abandoned, not because of lack of effectiveness, but because of the development of nystatin in the medical control of cholesterol. Dr. Henry Buchwald remains active 67 years later, and in 2012 Barcelona was appointed as Honorary Member of the Spanish Society of Obesity Surgery (SECO) and he will participate in Madrid-IFSO 2019.

Baltasar published in 1991 the only three ID in Spain for hypercholesterinemia.
First Spanish experience

Prof. Sebastián García Díaz of Seville carried out the 1st Scott-type Jejuno-ileal diversion (JID) in the Virgen Macarena Hospital on 11.19.1973. He began bariatric surgery in Spain with 12 cases (8-9) and then published 20 more, the 1st work in English by a Spanish author (7) in the World Journal of Surgery in 1981. For this 2nd work he received the award by the Seville Hospital of the Five Sores in 1979 (Figure 2). His work went unnoticed for 40 years until we rescued them in 2013 (11).

Figure 1. Genealogical tree of bariatric surgery.

Figure 1. Bariatric techniques
There are two Spanish JID done by Drs. Sánchez/Masdevall in Barcelona Bellvitge Hospital on March 1976 and another by Dr. Martínez, Zaragoza Clinic Hospital on July 12, 1978.

Buchwald\(^{(12)}\) describe (Figure 1) the tree of the development of this surgery in the 1970s with a big malabsorptive and restrictive operation. The evolution of malabsorptive surgery is on the left, and restrictive surgery and gastric bypass (GBP) were reported.

In 1964 Mason\(^{(13)}\) initiates the GBP. It was a total change in strategy. Capella\(^{(14)}\), Álvarez-Cordero\(^{(15)}\) (both first SECO Honorary Members) and Fobi\(^{(16)}\) made very important contributions to this technique and many other authors in the 1970s.

Baltasar AB\(^{(17)}\) performed in June 17, 1977 the first Mason-type GBP in Spain. Vara\(^{(18)}\), De la Cruz\(^{(19)}\) and Sitges\(^{(20)}\) wrote in Spain about ID in hypercholesterinemia and GBP in obesity.

Scopinaro\(^{(21)}\), a *tireless researcher and clinician*, initiated experimental and clinical gastrectomy with biliopancreatic diversion (BPD) in 1976\(^{(22,23)}\). He is the leader and *father of European bariatric surgery* and participated in multiple congresses and publications. His combined mixed a technique of gastrectomy plus BPD as the most effective for treating obesity\(^{(24)}\). He is an Honorary Member of SECO and the *only foreign Outstanding Achievement Award winner* (OAAW) of the American Association of Metabolic and Bariatric Surgery (ASMBS).

DBP became a very popular and was a commonly used technique in Spain. Larrad and Sánchez\(^{(25-28)}\) published extensively on a modification of their own and other authors used this technique in Zaragoza\(^{(29-32)}\), Santander\(^{(33,34)}\) and Barcelona.

Mason\(^{(35)}\) *"father of BS"* published in 1982, 18 patients on vertical banded gastroplasty (VBG) and it was the *1st great revolution* by making OS "easy and affordable".
AB (36) in 1984 broadcasts in RTVE the 1st Spanish documentary in MO entitled "JJ Soriano more moral than the Alcoy man". with IMC-52 and that blocked the telephone lines of the hospital. Laporte\(^{(37)}\) published the 1st Spanish VBG experience in 9 cases.

Reopening of the vertical staple-line was a serious disadvantage of the VBG because it cancels out the restrictive effect of the operation. Baltasar\(^{(38)}\) in 1989 described the separation with staples between gastric tube and major curvature and did not have a single recanalization in 100 cases. McLean\(^{(39)}\) used the same technique three years later. Alcoy's Andreo\(^{(40)}\) describes the typical radiological "peanut deformity" of the VBG.

Many Spanish surgeons performed VBG\(^{(41,43)}\). Baltasar\(^{(44)}\) published his first 100 cases in 1990 with excellent results, but 5 years later he reviewed the same patients and describes it as a "frustrated hope"\(^{(45,46)}\). And two years later this technique was abandoned.

Belachew\(^{(47,48)}\) in Belgium initiated on 1/09/1993 laparoscopy the 2nd revolution in bariatrics with the 1st laparoscopic adjustable gastric band (LAGB) operation.

Favretti\(^{(49)}\) performed on Sept 27.1995 the 1st LAGB operation in Spain at Madrid "La Paz" Hospital (Figure 3) assisted by Masdevall / Baltasar
Carbajo\textsuperscript{(50)} in 1986 made the \textit{1st} 12 BGL in Spain and Alastrué\textsuperscript{(51)} compares VBG with BGLA. Thousands of BGLA were done all over the world and then it was abandoned. \textit{Laparoscopy} changed the way of doing surgery not only in BS but also in all general surgery. Advances in bariatric laparoscopy, being repetitive operations and performed on healthy organs were the greatest advance in XX century surgery.

In the 90's the \textit{1st national bariatric societies} were created, starting with the American Society of Bariatric Surgery [\textit{ASBS}] by Edward Mason on \textit{June 3, 1983} in Iowa City, IO\textsuperscript{(52)}, the town he worked all his life. Deitel created \textit{Obesity Surgery}, as the \textit{1st journal of obesity} in 1990 \textsuperscript{(52)}.

In 1995 the International Federation of Surgery for Obesity (\textit{IFSO}) is founded and standards\textsuperscript{(53)} devised for reporting results.

The Spanish Society of Obesity Surgery (\textit{SECO}) was founded at Residencia Pérez Mateos, San Juan, Alicante by 26 surgeons on \textit{December 12, 1976} (Figure 5).

SECO joined IFSO in 1998 and AB became \textit{IFSO-2002 president}. He organizes and preside IFSO-Salamanca-2003. Dr. Antonio Torres, \textit{2nd Spanish president} of IFSO organizes IFSO-2019-Madrid, the world’s largest bariatric meeting. Spain will be the \textit{2nd country} that organizes this congress twice (Figure 6 and Figure 7).
SECO founding members

December 12, 1976
San Juan, Alicante, España
1. Aniceto Baltasar Alcoy
2. Juan Pujol Barcelona
3. Miguel A. Carbajo Valladolid
4. Santiago Tamames Madrid
5. Carlos Escalante Santander
6. Horacio Urquijo Madrid
7. Cándido Martínez Vitoria
8. Francisco Arlandis Alcoy
9. Rafael Bou Alcoy
10. Miguel A Calvo Bilbao
11. Antonio Alastrué Badalona
12. Eugenio Urquijo Madrid
13. Carlos Cerquella Madrid
14. Felipe de la Cruz Madrid
15. Mario García Madrid
16. Luis García Vallejo Santiago
17. Federico Leruète Granada
18. Juan Machuca La Coruña
19. José Mª Recio Barcelona
20. Carlos Masdeval Barcelona
21. Salvador Serrano Burgos
22. Tomeu Feliú Gerona
23. Antonio Soro Mallorca
24. Antonio Martín Madrid
25. Mariano Martínez Zaragoza

Figure 6. SECO Founding members
Wittgrove and Clark in October 27, 2003\textsuperscript{(55-57)} made the most significant step in performing the 1\textsuperscript{st} laparoscopic gastric bypass (LGBP) in San Diego. This is the 3\textsuperscript{rd} revolution of the BS. AB was the 1\textsuperscript{st} visitor in September 2007 in San Diego, and to our proposal Wittgrove\textsuperscript{(58)} dropped the huge circular #33 port and use the circular stapler without trocar, a very important step in those early times.

We performed the 1\textsuperscript{st} LGBP in Spain on 1.14.1997\textsuperscript{(59)} and presented it\textsuperscript{(60)} at Bruges IFSO-1998 the 1\textsuperscript{st} European to report it on video. Serra\textsuperscript{(61)} published in 1999 the 1\textsuperscript{st} world hernia after LGBP. Higa\textsuperscript{(62)} made fortunately the 1\textsuperscript{st} LGBPs with manual sutures. Baltasar\textsuperscript{(63)} published the 1\textsuperscript{st} book in Spanish in OS in 2000. Martínez\textsuperscript{(64)} from Vitoria published a bilingual BS book (Spanish and Basque) on 2001. De la Cruz\textsuperscript{(65)} published in 2006 the 1\textsuperscript{st} book on LGBP in Spain and carried out the 1\textsuperscript{st} surgical session in León. García-Caballero published an English book on diabetes surgery (Figure 8).

In 1988, Hess\textsuperscript{(66)} and Marceau\textsuperscript{(67)} initiated the duodenal switch (DS), a Sleeve-forming Vertical Gastrectomy (SFVG) plus BPD and Baltasar\textsuperscript{(68)} started it on 3.17.1994.

Ren/Gagner\textsuperscript{(69)} performed the 1\textsuperscript{st} world LDS in October 1999 and Baltasar on 5.10.2000\textsuperscript{(70)} the 1\textsuperscript{st} LDS in Europe. (Figure 9). This difficult and controversial technique by the Switchers surgeons, is rarely used today, in less than 1%.

Baltasar\textsuperscript{(71)} on 950 patients had a low mortality of 0.4% with LDS and is the most effective technique to lose weight.
There have been many technical variations in laparoscopy. In general, all viscera division is done with auto sutures. The anastomosis is done either with auto sutures or manual ones. We advocate the manual suture starting always with the sliding, self-locking sliding knot Resa and Solano (82).

SECO members reported BS surgeries in the early years of OS and SOARD. Spain was the 2nd country with the highest number of publications after the USA in 2005 and 2006 and in 2013 was the 5th country with the highest number of publications in SOARD. (Figure 10 and Figure 11)

<table>
<thead>
<tr>
<th>Country</th>
<th>Papers</th>
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<tbody>
<tr>
<td>United States</td>
<td>590</td>
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<td>United Kingdom</td>
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<td>Spain</td>
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SECO members have been very active publishing in OS and SOARD (Figure 8 and Figure 9). Among the SECO founding members there has been a high bibliographic volume.
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Laparoscopic Sleeve-forming gastrectomy (LSFG), the restriction part of DS, was so described by several authors in 2005. Baltasar LSFG\(^{(75)}\), according to Ahmad\(^{(76)}\) is the 61\(^{st}\) most cited article in all the bariatric literature. Angrisani\(^{(77)}\) claims that the LSFG is today the most commonly performed operation in the world.

We start the gastrectomy at the pylorus and suture the gastric anterior and posterior serosa, covering the staples, to prevent rotation of the sleeve and avoid leaks.

Rutledge described 1,274 cases of mini-gastric bypass in 2001\(^{(78)}\) and Spanish authors have developed two popular techniques. Carbajo\(^{(79)}\) performs since 2004 the lesser curvature reservoir without gastric resection, the one anastomosis OAGB, a GBP with latero-lateral diversion to an intestinal loop. He presented more than 3,500 cases at the 1919s World Congress in Valladolid and is today the fastest growing technique in the world. (Figure 12)

Sánchez and Torres\(^{(80)}\) at Madrid Clinic Hospital, describe in 2005 the one anastomosis DS or SADI in English. There is gastric resection in the form of SFG and the BPD is done end-to-side at the duodenum (D1). The operation is becoming very popular all over the world. Currently they have more than 350 cases. (Figure 13)

BS at Barcelona Bellvitge hospital has organized 16 consecutive bariatric courses and Torres/Sánchez another 16 annual courses at Madrid Clinic Hospital.

We founded BMI-Latina Journal (Iberoamerican Bariatric and Metabolic) www.bmilatina.com in 2011 as an a online magazine published in Spanish, English and Portuguese. Adopted by SECO in 2015, it should play a valuable role in Spanish and
Portuguese speaking BS societies but since 2015 only the abstract is published in English, and that may restrict its dissemination.

In 2009, Scopinaro, Melissas, Fried and AB create the IFSO European Chapter of the Centers of Excellence Program (ECEP). Currently, several Spanish centers and surgeons use this prestigious quality control program.

SECO members have participated in numerous local, regional, national, and international meetings and congresses, especially in Latin American societies where SECO has always been very kindly well received. In May 1998 we organized a table at the meeting of the prestigious course of Prof. Moreno González, with Drs. Cowan, Fobi, Scopinaro, Clark & F.de la Cruz.

In 2003, AB inaugurated the Spring (NYC) and Fall (Chicago) two keynote lectures at the American Congress of Surgery with on DS.

AB received the IFSO-Lifetime Membership Award in June 2011 and was a finalist for the prestigious ASMBS-Outstanding Achievement Award at the ASMBS meeting in Orlando, Florida. (Figure 4)

**Diabetes Surgery**

Part of the BS is dedicated to diabetes as metabolic surgery. Baltasar\(^{(80)}\) publishes a successful 1\(^{st}\) intervention in 2004 BPD-without-SFG.

Resa and Solano\(^{(82)}\) describe 65 cases of gastro-ileal bypass as the simplest, quickest and safest technique we know for treating obesity. And then Resa\(^{(83)}\) again publishes 1512 more cases. Alhambra\(^{(84)}\), Vidal\(^{(85)}\), Vilarrasa\(^{(86)}\), García\(^{(87)}\), Cruz\(^{(88)}\) and Torres\(^{(89)}\) have published on the same subject.

**Laparoscopic OS in Children and Adolescents (ABS)**

OS is increasingly used in children. Baltasar\(^{(90-91)}\) published the 1\(^{st}\) national SFG in 2004 on a 10-year-old boy with excellent results 10 years later.

Carbajo\(^{(92)}\) has a case with 5 years follow-up and then in 2019 again\(^{(93)}\) reports the more extensive experience in CLONA with 39 patients treated with OAGBP with excellent results.
Vilallonga\cite{94} reports that the overweight rate in 4–24 years-old children has increased by approximately 10% in the last 20 years. It is estimated that today, 20% of boys and teenagers and 15% of girls are overweight.

**Robotics bariatric surgery**

Cadiere and Favretti performed the *world's 1st robotic bariatric operation* at a distance in 1998. Diez and Blázquez perform the *first 12 robotic Spanish bariatric surgeries* in Vitoria-2013. Vilallonga (*1st accredited robotics surgeon in Spain*) and Fort from 2010 in the Hospital Vall d’Hebron in Barcelona develop robotic surgery\cite{94} and performed more than 540 cases with the da Vinci (Fig.13) Surgical System® (Intuitive Surgical, Sunnyvale, CA) at the beginning with GV and them DG robotics\cite{95}.

Morales\cite{96} performs in Seville the complex single port surgery of since 2012 and today leads the European surgery\cite{97}. (Figure 14)

![Figure 14. Da Vinci R. Vilallonga S. Morales A. Lacy](image)

A. Lacy initiated AlS-Channel as a pioneering worldwide on-line TV transmission and made the *1st BS remote operation by cellphone G5 from Barcelona Clinic Hospital on 4.14.2019* at the WORLD-VIDEO Forum Barcelona-2019.

**Surgeries performed in Spain 2018**

\textbf{1st-Surgeries}: 5,952; \textbf{2nd-Revision}: 343;

\textbf{Total Complications}: LGBP-3.7% and LSFG-3.6%; LGBP-Leaks-1.2%, Bleeding-2.3%, PET-0.1% \textbf{Re-op}-2.3% Exitus-0.1% and in \textbf{SFG}-Leaks-1.5%, Bleeding-1.9% PET-0.1% 2.1% \textbf{Deaths}-0.1%. Extraordinary good results!

Private centers report multiple operations over the years with different techniques: Valladolid-4,255, Teknon-3,000, De la Cruz-2,493, Zaragoza-2,649, Alcoy-1,729.

We should publish all serious complications such as malnutrition\cite{97-98}, leaks\cite{98,100}, total gastrectomy's\cite{101}, liver failure\cite{102-105}, stapling of the bougie\cite{106}, emergency tracheostomy\cite{107}.
and mistakes as the Journal of negatives or non-positive results (JONNPR)\(^{(108)}\), since it is more likely to learn from negative results than positive ones.

BS is performed in public centers in all regions of Spain with very low leakage and complication rates. But... it is not yet performed on an outpatient basis.

If OM is an epidemic pathology and if CB is the best solution, it should be accessible to more subjects. Duncan\(^{(109)}\) performs ambulatory BS, and this will be the 4th great bariatric revolution. His A-team uses 2 operating rooms, 2 anesthesiologist nurses, 2 scrub nurses and an operating room technician as an assistant. Operative times of 22`. The surgeon passes to OR-2 with the patient already anesthetized. He changes gloves and do 5 patients in total in the morning. In the afternoon, surgeon-B operates while team-A have consultations. Total 10 patients per day. 50 cases per week, 2,2000 cases per year. No overnight stay. All morning patients are discharged before 14 hours. There is no hospitalization.

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