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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.

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Palabras clave

Obesidad mórbida; Cirugía bariátrica; SECO

Nomenclature

Add **L** for laparoscopic

English	**Abbreviated**
Vertical Banded Gastroplasty	**VBG**
Gastric Banding	**GB**
Roux-en-Y gastric bypass	**RY-GBP**
One Anastomosis GBP /mini GBP	**OAGB**
Bilio-pancreatic Diversion	**BPD**
Intestinal diversion	**ID**
Duodenal Switch	**DS**
Single Anastomosis Duodenal-Ileostomy	**SADI**
Sleeve-Forming Gastrectomy	**SFG**
Adolescent Bariatric Surgery	**ABS**
Revision/Conversion of prior surgery	**REV**
Morbid Obesity	**MO**
Weight loss	**WL**
% Excess Weight Loss	**%EWL**
% Expected BMI Loss	**%ExBMIL**

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[(3)] and Scott[(4)] 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[(5)] 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[(6)] published in 1991 the only three ID in Spain for hypercholesterinemia.

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First Spanish experience

Prof. Sebastián García Díaz of Seville carried out the *1st* Scott-type Jejune-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].

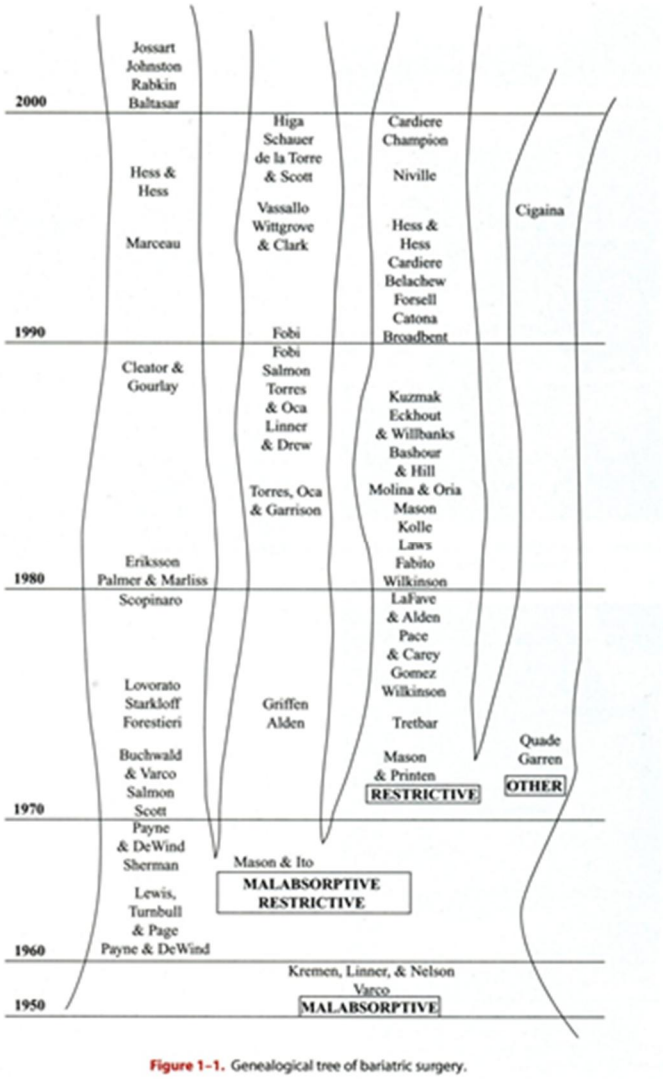

Figure 1. Bariatric techniques

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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".

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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.

Figura 2. H. Buchwald S. García Díaz E. Mason N. Scopinaro

Favretti[49] performed on Sept 27.1995 the *1st LAGB* operation in Spain at Madrid "La Paz" Hospital (Figure 3) assisted by Masdevall / Baltasar

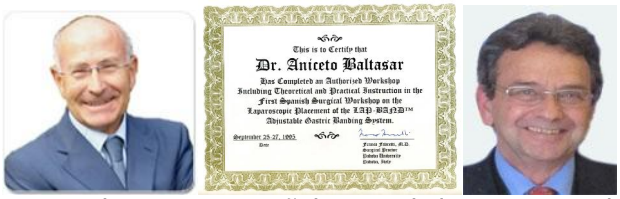

Figure 3. Favretti 1ª BGLA española. Hospital “La Paz” Madrid. 1995

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Carbajo[50] in 1986 made the *1st 12 BGL* in Spain and Alastrué[51] compares VBG with BGLA. Thousands of BGLA were done all over the world and then it was abandoned. *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 *1st national bariatric societies* were created, starting with the American Society of Bariatric Surgery [**ASBS**] by Edward Mason on *June 3,1983* in Iowa City, IO[52], the town he worked all his life. Deitel created *Obesity Surgery*, as the *1st journal of obesity* in 1990 [52].

In 1995 the International Federation of Surgery for Obesity (IFSO) is founded and standards[53] devised for reporting results.

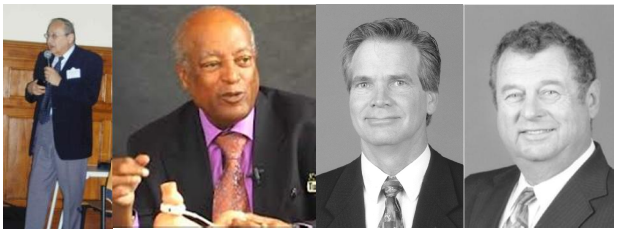

Figure 4. M. Deitel M. Belachew A. Wittgrove W. Clark

The Spanish Society of Obesity Surgery (**SECO**) was founded at Residencia Pérez Mateos, San Juan, Alicante by 26 surgeons on *December 12.1976* (Figure 5).

Figure 5. SECO 1976 SECO 2015 Baltasar 2011 AMSBS-OAAW

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

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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 Leruite	Granada
18.	Juan Machuca	La Coruña
19.	José Mª Recio	Barcelona
20.	Carlos Masdevall	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

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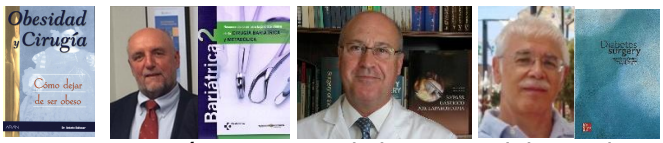
1. Dec 1997 Aniceto Baltasar Torrejón
2. May 2001 Cándido Martínez Blázquez
3. Oct 2004 José C. Fernández-Escalante
4. April 2007 Antonio José Torres García
5. April 2011 Carles Masdevall Noguera
6. April 2013 Felipe de la Cruz Vigo
7. May 2015 Juan C. Ruiz Adana Belbel
8. March 2017 José A. Ramírez Felipe
9. Sept 2019 Raquel Sánchez-Santos

Figure 7. SECO Presidents

Wittgrove and Clark in *October 27, 2003*[55-57] made the *most significant step in performing the 1st laparoscopic gastric bypass* (LGBP) in San Diego. This is the *3rd revolution of the BS*. AB was the *1st visitor* in September 2007 in San Diego, and to *our proposal* Wittgrove [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 *1st LGBP* in Spain on *1.14.1997*[59] and presented it[60] at Bruges IFSO-1998 the *1st European to report it* on video. Serra[61] published in 1999 the *1st world hernia after LGBP*. Higa[62] made fortunately the *1st LGBPs* with manual sutures.

Baltasar[63] published the *1st book* in Spanish in OS in 2000. Martínez[64] from Vitoria published a bilingual BS book (Spanish and Basque) on 2001. De la Cruz[65] published in 2006 the *1st book* on LGBP in Spain and carried out the *1st surgical session* in León. García-Caballero published an English book on diabetes surgery (Figure 8).



Baltasar-2000 C. Martínez F. de la Cruz Diabetes de Caballero

Figure 8. Books published by SECO members

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

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

Baltasar[71] on 950 patients had a low mortality of 0.4% with LDS and i*s the most effective technique to lose weight*.

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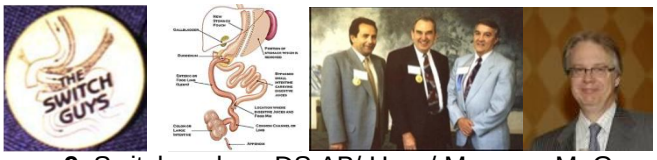

Figure 9. Switchers logo DS AB/ Hess/ Marceau M. Gagner

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)

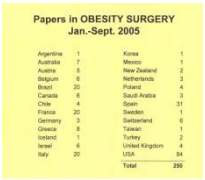

Table 1. Papers in *OBESITY SURGERY* by Country, January – December 2006

Argentina	3	Germany	10	Russia	1
Australia	11	Greece	12	Saudi Arabia	2
Austria	13	Israel	10	Singapore	2
Belgium	12	Italy	25	Spain	33
Brazil	27	Korea	3	Sweden	5
Canada	8	Kuwait	1	Switzerland	12
Chile	5	Lebanon	2	Taiwan	7
China	3	Mexico	2	Turkey	3
Cyprus	1	New Zealand	4	United Kingdom	7
Czech Republic	2	Netherlands	9	USA	106
Finland	1	Poland	5		
France	24	Portugal	3	Total	374

Figure 10. Publicaciones españolas de SECO en Obes. Surg. 2005-6

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United States	590
United Kingdom	23
Canada	23
Italy	19
Spain	13

Figure 11. Spanish publications in SOARD 2014

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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(Alcoy-124, Carbajo-76, Belvitge-38, Alastrué-30, Martín-Duce-27, Martínez C.-22, Ballesta-9, Zaragoza-5). In 2003 SECO made the Salamanca Declaration on BS[74].

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 *61st 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 t*he 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 fasters growing technique in the world*. (Figure 12)

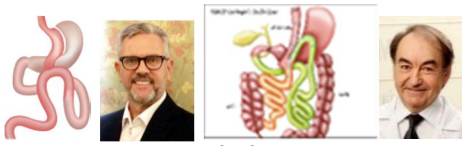

Figure 12. OAGP R. Rutledge OAGBP MA. Carbajo

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)

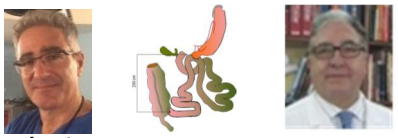

Figure 13. A. Sánchez SADI A. Torres

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

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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 *1st 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 *1st 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.

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Vilallonga[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[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[95].

Morales[96] performs in Seville the complex single port surgery of since 2012 and today leads the European surgery[97]. (Figure 14)

Figure 14. Da Vinci R. Vilallonga S. Morales A. Lacy

A. Lacy initiated AIS-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

1st-Surgeries: 5.952; **2nd-Revision**: 343:

Total Complications: LGBP-3.7% and LSFG-3.6%; LGBP-Leaks-1.2%, Bleeding-2.3%, PET-0.1% **Re-op**-2.3% Exitus-0.1% and in **SFG**-Leaks-1.5%, Bleeding-1.9% PET-0.1% 2.1% **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[97-98], leaks[98,100], total gastrectomy's[101], liver failure[102-105], stapling of the bougie[106], emergency tracheostomy[107]

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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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