Four decades of advances in general surgery in a community hospital of Spain

Aniceto Baltasar*, Carlos Serra, Marcelo Bengochea, Carlos Escrivá, Emilio Marcote, Rafael Bou, Javier Miró, Francisco Arlandis, Lirios Ferri, Luis Cipagauta, Nieves Pérez, Mario Alonso and Rosa Martínez
Alcoy Hospital, Alcoy. España, Spain

Abstract
Changes in the practice of surgery over the last 40 years have been extraordinary. We want to reflect the progress during this period in the Community Hospital of Alcoy, Spain. Technology and staff training have improved in an extraordinary way allowing that medical assistance in the community hospitals is quite similar to that offered at the most sophisticated centers.

Introduction
The changes in medicine with the creation in 1967 of the National Health System (NHS) in Spain and the Intern and Residents training (IRT) system have been extraordinary. The NHS network of hospitals covers medium-sized cities with Community Hospitals (CH) of less than 300 beds and 250,000 inhabitant’s coverage.

Geographical and historical context
Alcoy with 60,000 inhabitants, and its health department with 140,000 persons in South-eastern Spain was first served by a magnificent Oliver Civil Hospital donated by a patron in 1868-77, but then faded with time and reflects what happened in other Spanish regions. The city, isolated, is located in mountainous area of the Valencia Region 60 km far from Alicante and 100 km from Valencia.

Alcoy CH was the first Community hospital of the Valencia Region and it was inaugurated in 1972 but the Head of Surgical Service was not appointed until 1974. The training of first IRT residents started in Spain in 1967 and graduated five years later, but many were not attracted to work in a supposedly “distant hospital” far from large centers and big cities, where the endowments were initially precarious. But by 1978 in Alcoy there were five IRT surgeons, and the coverage of other services took four more years to provide minimal services.

The dark years 1974-78
Aniceto Baltasar MD (AB) was appointed in 1974 as Head of Service and started working alone with only one assistant (J. Tomas MD) until 1978. Later on, 7 non specialist fellows (Del Rio, Bou, Fernández, Aracil, Pérez, Carbonell and Llopis) gave us an invaluable support. We opened an Intensive Care Unit (ICU) in 1976 with 3 beds, two pressure and three volumetric ventilators, monitors, PVC, hypothermia blankets, anti-scar mattresses, gas analyzer, cardio conversion and pacemakers. Twelve young nurses were trained with daily classes and the translation of two books on Ventilator and Cardiac Care [1,2]

We abandoned the traditional cut-down venotomies in favor of the subclavian punctures and initiated the use of complex procedures (aortic grafts, femoro-popliteal bypasses, Swiss AEO osteo-synthesis, 52 transverse and Seldinger angiographies (52), bronchoscopies (45), intra-cavitary and epicardial pacemakers (46), lung lobectomies, Comando mandible resection, fibro-gastroscopy (28), mid-ternal thoracotomy for mediastinal tumor, porto-cava shunts, Nyhus pre-peritoneal hernia and pancreatotomies.

Years 78-90. Open surgery
Then in 1978 the four first IRT well trained surgeons (Bengochea, Del Río, Marcote, Escrivá) and by 1987 two more, Bou and Miró, joint us members of the staff. Later on Arlandis and Alonso arrived in 1990, and Serra (current Chief of the Service), Martínez and Cipagauta in 1992 (Figure 1), and by then the surgical team with 11 members was

Figure 1. Alcoy CH Surgical staff.

Correspondence to: Aniceto Baltasar, Alcoy Hospital, Alcoy. España, Spain, Tel: +34-616.321.021; E-mail: baltasarani@gmail.com

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By 1985 other services staffs (Anesthesia, Radiology, Digestive-endoscopy, ICU, Pathology) were filled. In 40 years the Surgical Service have been very fortunate to have an stable staff since only three members left the service to occupy relevant positions in other hospitals and by 1998 obtained the IRT teaching position of one resident per year, and has become an organ donor center, has MRI and an oncology service with radiotherapy.

**Colostomy irrigation**

In 1983 we founded Alcoy Ostomy Club (AOC) and Spanish Ostomy Club (SOC) and organized three meetings in Alcoy. We started colostomy irrigations in Spain [3], a very uncommon therapy and published two videos [4], and a paper with permission from the Mayo Clinic of MN [5]. In this volunteer program a patient with a colostomy visits patients in the pre and postoperative period and shows them what a colostomy is. He teaches the patient and his family the technique of colostomy lavage before discharge and the use of a plugging device that allows him to live "without using a colostomy bag", as a normal person without any psychological traumas, to participate in social events and even to bathe in public swimming pools. All the patients have performed their irrigation every two days for years.

Ms. Encarna Nadal has been teaching and caring for all patients with ostomies for 30 years and participated in two National TV programs to publicize the irrigation and received recognition awards by the Alcoy CH in November 1995 and the Rotary Club Alcoy in 2016 for his disinterested dedication.

**Vascular surgery**

In the years 1970-80 there were no Vascular Surgery Units in the country but this surgery was performed in many hospitals. We started in the country the 1st use of Inahara [6] technique of evison retrograde thrombectomy (ERTE) that had better results than the vascular grafts. We introduced the technique in National Surgical and Vascular Surgery Congresses. An ERTE video [7] received the Motril Aesculapius Award in 1984, the most important in Spain at that time. We started the use of "Sparks grafts", an ingenious attempt to "create vessels" [8], but without long-term success, since progressive fibrosis of the grafts finally obstructed the vessels.

Major infra-abdominal aorta major surgery, mesenteric vessels, iliac, femoro-popliteal bypass, carotid aneurysms were carried out. Unilateral ERTE from aortic bifurcation to the femoral bifurcation were the most frequent under regional anesthesia.

The Valencia Vascular Surgery Society 1st Meeting was held in Alcoy in October 1988, attended by Juan Matessan, a distinguished Boston-trained surgeon and 1st chief of the Madrid Clinic University Hospital (Figure 2).

We reported on aortic aneurysms [9], internal carotid aneurysm [10, 11], combined aortoiliac and double bowel revascularization [12], venous aneurysm [13] and anastomotic aneurysm [14]. The Vascular Services in the Valencia community started working and in 1998 and then we abandoned this surgery.

**Vascular and oncologic surgery**

Nine cases of radical oncology and vascular resection were done. The 1st in 1985 was a sarcoma in the middle third of the right thigh including the femoral vessels. A radical resection of the tumor and vascular reconstruction (arterial with Dacron, femoral veins with two inverted saphenous vein grafts, and the formation of arterial-venous fistula at the ankle to prevent thrombosis of the veins) was done and this patient currently lives [15].

In 1982, a patient had a recurrent retro-peritoneal metastatic disgerminoma involving the infra-renal aorta wall. She had a radical left nephrectomy and infra-renal aortic resection. An Dacron aortic graft was used to reconstruct the aorta, and is currently living [16]. Until then, only one case of aortic resection and vena cava had been published by Crawford and De Bakey [17], 7 cases of 297 sarcomas by Fortner, et al. [18] from the NYC Memorial and 13 cases by Imparato et al. [19] at Roswell Park in Buffalo, NY, both recognized global centers dedicated to cancer.

We then performed four infra-renal aortic resections for retroperitoneal sarcomas [20] and presented a video at the ACS American Congress in Chicago at the Symposium “Spectacular Problems in Surgery” [21] an unusual technique at that time. And the ACS requested to present it again eight years later and it was done by Dr. Serra in San Francisco and is in ACS Video Library.

One of those resected sarcomas recurred at the left iliac vein 2 years later and the left iliac-femoral (left artery and vein) were resected [22], and had a cross-femoral revascularization with two saphenous (for artery and vein) were done. He suffered massive hemorrhage from pelvic veins and was treated with abdominal packing. He remained intubated at the ICU and was re-operated three days later, the pelvis was clean and the abdomen was closed, and both cross-femoral grafts remained permeable.

**Thoracic surgery**

From the beginning, we performed thoracic surgeries such as bronchoscopies (from 40 to 68 per year), tracheotomies (8-12), thoracoscopy, pneumo-thorax (12-15), lobectomies and pneumonectomies for cancer (7-11), esophagus (9) and endocavitary pacemakers. We introduced thoracoscopy in 1993 and performed bilateral sympathectomies for hyperhidrosis, emphymatous bullae [23], neurilenoma [24] and the 1st pericardiial window due to effusion in the country [25]. In 2003 all thoracic surgery was transferred to the newly created regional referral center.

**Neck**

We did treated thyroid and parathyroid tumors, radical neck dissections [26], parotid tumors [27], two rare cases of suffocating retro-pharyngeal cervical lipomas [28,29] and radical surgery for cervical esophagus cancer with gastroplasty [30].

Four esophageal lesions [31] due to autolysis with Salfuamant were operated with immediate resection of the esophagus and stomach and then colonic transposition. Subsequently, two of them developed late
switches. We used sphincteroplasty [60-62] according to Austin Jones [63] in 67 cases with bile duct obstruction of 558 gallbladder operations with a mortality rate of 1.5%.

We performed in 1980 the 1st cephalic pylorus-preserving in pancreatectomy in Spain [64], with a continuous monoplane posterior pancreateo-gastrostomies not usual at the time.

In 1989 we initiated the duodenal preservation in cephalic resection of pancreas by chronic pancreatitis [65,66] according to Beger et al. [67]. A video, the first presented [68] at the ACS in Chicago 2006 is on ACS video library and Martínez et al. [69] made a review of four cases.

Retained foreign bodies in the abdomen are an unpleasant complication and we used compresses with rings [70,71] as very effective to avoid them and no patient suffered this complication in 40 years (Figure 4).

Continuous sutures were done in abdominal closures and in digestive anastomosis [72,73], and Serra et al. [74] used the 1st Spanish self-expanding prostheses in colonic obstructions. Pardo et al. [75] publishes in 1996 (Figure 5) the “Index of authors who publish the most” in Spanish Surgery. And Alcoy-CH ranks 1st among CH and 7th since 1973-93 among all the country hospitals and the 1st of all in June 1996.

Laparoscopic surgery: 1992

Starting in 1992 laparoscopy has been the biggest surgery revolution in these forty years. We were spectator in the 1st laparoscopic gallbladder at the Ruber International Sanatorium in Madrid in 1990. We started our 1st gallbladder by lap in 1991, oophorectomy...

**Bariatric surgery (BS)**

Alcoy-CH is recognized as a pioneer bariatric center [76]. We funded SECO (Spanish Society for Obesity Surgery) in 1997, the BMI-Latin magazine (www.bmilatina.com) in 2011 and had the IFSO Presidency and World Congress in 2003. We performed in 1977 the 1st RNY gastric bypass in Spain [77], 1st metabolic surgery for hypercholesterolemia [78], 1st VGB separation of the vertical line [79,80], 1st open DS in 1995 [81], 1st lap RNY in Europe 1977 [82,83] and 1st world report of internal hernia after RNY-GB [84], 1st lap LDS [85] in 2001. The paper on Sleeve Gastrectomy was one of the 1st in Europe [86] has the 61st higher bariatric citation index in the world [87]. Non-removable Wall-stents for leaks [88,89] were used before the removable ones were developed. 1st RNY diversion for SG leaks [90], 1st diabetes surgery 2004 [91], 1st and adolescent bariatric surgery (ABS) 2008 [92] and developed the concept of Expected BMI after BS [93], cofounded the European Centers of Excellence in 2013.

**Associations and congresses**

Founders Video-Revista de Cirugía (VRC) with Dr Ballesta-1987 in four languages (French, Italian Spanish and Portuguese) www. bmilatina.com


For 20 years (1987-2007) organized the Alicante Meetings of Surgery, every year in Alcoy

1984-2004 Detailed Memories (Annual Reports) of the Service.


101 in Spanish-. 3 first Prizes and 12 winners in Videomed and Video-Surgery Valencia

44 in English-. 2 First prizes and 3 more prizes

http://www.youtube.com/channel/ UCEpwVhQDohxuKOhNq712zg

273 articles published in surgery and 109 in bariatric.

We have the Maximum number of citations in the province of Alicante by Research Gate: Publication downloads 10,878. Views 8,631, 1.99 per publication, 1,154 citations.

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