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The Emergency Hospital Bucharest to the Forefront of the Emergency Laparoscopic Surgery Development

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Abstract
The use of laparoscopy in traumatic and non-traumatic abdominal surgical emergencies is unanimously accepted due to the well-known advantages of minimally invasive surgery. In the period 1961-1966 in the Clinical Emergency Hospital of Bucharest (CEHB) the first diagnostic laparoscopes were performed in the acute surgical abdomen, respectively in the obstructive jaundice by dr. Gh.Popovici, respectively dr.C.Petrescu.In the modern era, the first laparoscopic cholecystectomy was performed in 4 dec. 1993 by A.E.N.In 1994 the first laparoscopic appendectomies, gynecological emergencies, exploration in traumatic abdominal contusion, followed by perforated ulcer (1995), intestinal occlusion (1997), were performed. In the specialized literature, out of the 42 emergency laparoscopy articles published in the journal “Chirurgia” (1994-2019), 16 (38,08%) belonged to the CEHB team, 11 of AEN. In 2004 the original monograph "Laparoscopic Emergency Surgery" appeared. Specialized chapters are added in different volumes of surgical pathology.
At the Romanian Assocation of Endoscopic Surgery Congress (RAES) of 2008, the international participation course “Laparoscopy in the acute abdomen” was organized. Since 2013, annual trauma workshops (DSTC ™) and non-traumatic abdominal emergencies have been organized with international participation by CEHB, the surgery clinic, and the UMFCarol Davila Department of Anatomy. CEHB surgeons presented papers at EAES,EATES and ESTES congresses. Of the 1699 laparoscopic operations performed in the clinic in 2018, accounting for 31.27% of the total operations, 493 (29.01%) were in emergency. The SCUB surgeons have had and have a major contribution in preparing the residents, implementing and developing emergency laparoscopy within the miniminvasive therapy, the therapy of the future.

Keywords : laparoscopy, emergency surgery, medical history

Introduction

The laparoscopic revolution of 1987 initiated by "French Connection", Ph.Mouret, F. Dubois, J. Perissat, or "Second French Revolution", forever changed the surgical techniques (1).No other surgical technique was so quickly accepted, used and developed as laparoscopic cholecystectomy (LC), which was also the birth certificate of the minimal access therapy adopted by all surgical specialities (2).

The advantages of laparoscopic surgery are well known—large image, an advantage for the surgeon, but especially a very low surgical trauma compared to classic open surgery—materialised by the substantial improvement of the postoperative comfort for the patient: reduction of complications, hospitalisation, recovery and cosmetic appearance. Finally, there is a reduction in medical costs, a "bubble of oxygen" for the health system.

Although initially applied with great reluctance, the use of laparoscopy in abdominal surgical emergencies has undergone sustained development due to surgeons with experience in emergency and laparoscopy. In the beginning, the therapeutic laparoscopy (TL) in emergency was used

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only for establishing the diagnosis, but it was permanently developed after 1988, with obviously the same advantages listed above (3). It is primarily used in the non-specific acute abdominal pain as a diagnostic method, when the clinical and imaging examinations are inconclusive, and when the minimally invasive surgery can be performed. It also has the advantage that in particular situations, it can be converted to open surgery.

Given the emergency specificity of the Clical Emergency Hospital Bucharest (CEHB), we set out to evaluate the role played in the implementation and development of emergency laparoscopic surgery (ELS) on a national level.

Material and method

To assess the contribution of the Surgery Clinic team of CEHB in the development of emergency laparoscopic surgery, we researched the following:

- the literature describing the beginning of diagnostic laparoscopy (DL) in abdominal surgical emergencies in the 60s;
- surgical protocols from the period 1993-2000;
- the articles about emergency laparoscopic surgery published in "Chirurgia" journal (1995-2019), and we identified the surgeons from EHB who published articles on this topic as first authors; we used the bibliography of the article written by professor C.Dragomirescu and the website www.revistachirurgia.ro/archive/,2003-2019 (4,5);
- the articles published in other journals using PubMed and "www.researchgate.net", for both articles and number of citations (6,7).
- the abstracts presented at international conferences in Europe, EAES (European Association of Endoscopic Surgery),EATES(European Association of Trauma and emergency Surgery) and ESTES (European Society of Trauma and Emergency Surgery, founded in 2007);
- the monographs, book chapters, guides published by CEHB surgeons;
- the courses with international attendance which included the subject of emergency laparoscopic surgery;
- the prevalence of emergency laparoscopic surgery from the total of laparoscopic interventions, and the total of surgical procedures performed in CEHB in 2018.

Results

From the existing data, diagnostic laparoscopy in abdominal surgical emergencies was performed for the first time in Romania at the CEHB. The first procedures were performed in 1961, at the initiative of professor I. Turai, the head of the clinic. The initiative was consistent with the worldwide tendency of using laparoscopy for establishing a diagnosis in emergency cases (8,9). The results were used for two dissertation thesis. The first thesis was defended in 1964 by dr. Gh.Popovici—The Value of Laparoscopy in Acute Syndromes of the Abdomen (8). The second thesis was defended by Assoc. Prof. C. Petrescu, MD, PhD, in 1965 and presents 32 cases of obstructive jaundice. To obtain an etiological diagnosis, the gallbladder was punctured under laparoscopic guidance, and contrast medium and air were injected: "Laparoscopic cholangiography" (Fig.1) (10,11,12). Diagnostic laparoscopy was not used after 1966.

Fig.1.Laparoscopic Cholangiography

During the "Laparoscopic Revolution" era, the first laparoscopic cholecystectomy was performed in our clinic on 4 December 1993 by the author helped by Dr. F. de Weer (Belgium), dr. D. Venter, dr. M. Florin and dr. Rodica Florescu, anaesthesiologist (fig.2). Three more surgical laparoscopic cholecystectomies were performed that year (8).

Fig.2. Dr.A.E.Nicolau, prof dr.F. de Weer,

dr.A.I.Bucur (5dec.1993)

In August 2004, other emergency laparoscopic surgical interventions were performed, for the first time in the clinic: laparoscopic appendicectomy, salpingectomy in a ruptured ectopic pregnancy with hemoperitoneum, diagnostic laparoscopy in an abdominal contusion with a pelvic fracture and a positive lavage, in which case an unnecessary laparotomy was avoided. Dr. S. Jianu performed for the first time a laparoscopic suture of a perforated duodenal ulcer in February 1995. An intestinal flange sectioning and a laparoscopic lysis of bowel occlusion was performed in November 1997.

It is also important to note that the surgery residents who performed internships in the clinic, have acquired the techniques of laparoscopic operations in emergency.

In the period 1995-2009, one of us (AEN) published in "Chirurgia" 4 articles about the laparoscopic suture of perforated peptic ulcer, one about the technique, and 3 articles about the utility of laparoscopy in abdominal trauma, 2 of them case presentation: ileal perforation and diaphragmatic hernia after stub wounds(4). In the period 2009-2019, there were 7 articles published in the same journal (5,13-19).In total there where 42 articles about emergency laparoscopic surgery published in "Chirurgia" journal in the period 1995-2019, out of which 16 (38.09%) were written by SCUB surgeons,11 by A.E.N (4,5).We also found other six articles published in other journals (Table 1) (19-24).

Table 1. Published articles and citations

Journal	Total no. of emergency laparoscopic surgery articles	No. of articles from SCUB (citations)	No. of articles of AE Nicolau (citations)
"Chirurgia"	42	16 (69)	11 (64)
Other	undetermined	6 (1)	1 (0)

SCUB surgeons have written chapters which include emergency laparoscopic surgery in textbooks, surgical pathology books and therapeutic guidelines: "Surgery Textbook" under the editorship of M. Beuran (2003), "Surgery Textbook" under the editorship of I.Popescu, M.Beuran (2007), "Surgery Treaty" under the editorship of I. Popescu (2008), "Surgery Textbook for Students", under the editorship of E. Bratucu (2009), "Surgery Course for Students" under the editorship of M. Beuran (2013), "Gastroenterology" (2014) under the editorship of G. Constantinescu, „Abdominal Trauma Management Guide", Romanian Ministry of Health (2015), etc. The original monograph "Emergency Laparoscopic Surgery" of A. E. Nicolau, 231 pages with 73 personal intraoperative colour photos, in 550 out of print copies. The PhD thesis defended in June 2001 underpinned the monograph (Fig.3).

Fig.3.Original monography "Emergency Laparoscopic Surgery"

A large number of surgeons participated in international congresses and presented papers: in EAES (European Association of Endoscopic Surgery) since 1994 and with presentations since 1997, in EATES in 2000 and 2006, and then in ESTES starting with 2007. In the final program books of the EAES congresses I have disposed (1997-99,2006-10,2012,2015,2017), I found 21 papers, posters and videos presented by romanian surgeonas, of which, 13 were from CEHB.There were 10 presentations about emergency laparoscopic surgery in EATES and ESTES (25,26).

Under the guidance of professor M. Beuran, the surgeons of the SCUB Surgery Clinic also had a sustained teaching activity by organising courses on the subject of emergency laparoscopic surgery during the 2008 national surgery congresses and up to now. On the occasion of the 4th RAES (Romanian Association of Endoscopic Surgery) Congress (Iasi, October 2008), the first international emergency laparoscopic surgery course "Laparoscopy in the acute abdomen" was organised, course directors, prof. L. Fulger, , prof. E.Tarcoveanu, dr. AE Nicolau (Fig.4).

Fig.4.RAES 2008 cours.

A significant and beneficial initiative was the annual organisation of international courses with the participation of renowned experts by UMF Carol Davila, Department of Anatomy (professor F. Filipoiu) and the Department of Surgery (professor M.Beuran). There are theoretical and practical courses that also have an emergency laparoscopic surgery component (27). Thus, there is the "International Trauma Workshop - based on definitive surgical trauma care - DSTC™", respectively the "International Surgery Workshop for Visceral and Gastrointestinal Emergencies (other than trauma)", president professor S.Uranues (Graz, Austria), course directors professor M. Beuran, professor F. Filipoiu, professor D.Vasile. (Fig.5) (28).

Regarding the ratio of emergency laparoscopic surgeries, we presented in 2018 a comparison of 1993 versus 2018 on the occasion of 25 years of laparoscopic surgery in SCUB, which we now correlate with a similar presentation from 1993-2003-2013 (29). A comparison of 2013 versus 2018 is presented in Table 2.

Table no.2 Surgeries 2013 versus 2018 * histopathologically confirmed

Year	**2013**	%	**2018**	%
No. of surgeries	**6599**	100	**5433**	100
No. of laparoscopic surgeries	**1657**	25.10	**1699**	31.27
No. of emergency laparoscopic surgeries	**581**	35.06	**529**	31.13
Acute cholecystitis *	321	100	374	+16,51
Acute Appendicitis	127	100	106	-16.53
Perforated ulcer	7	100	5	-28.57
Bowel obstruction	2		-	
Gynaecological	50	100	44	-12
Trauma	4		-	

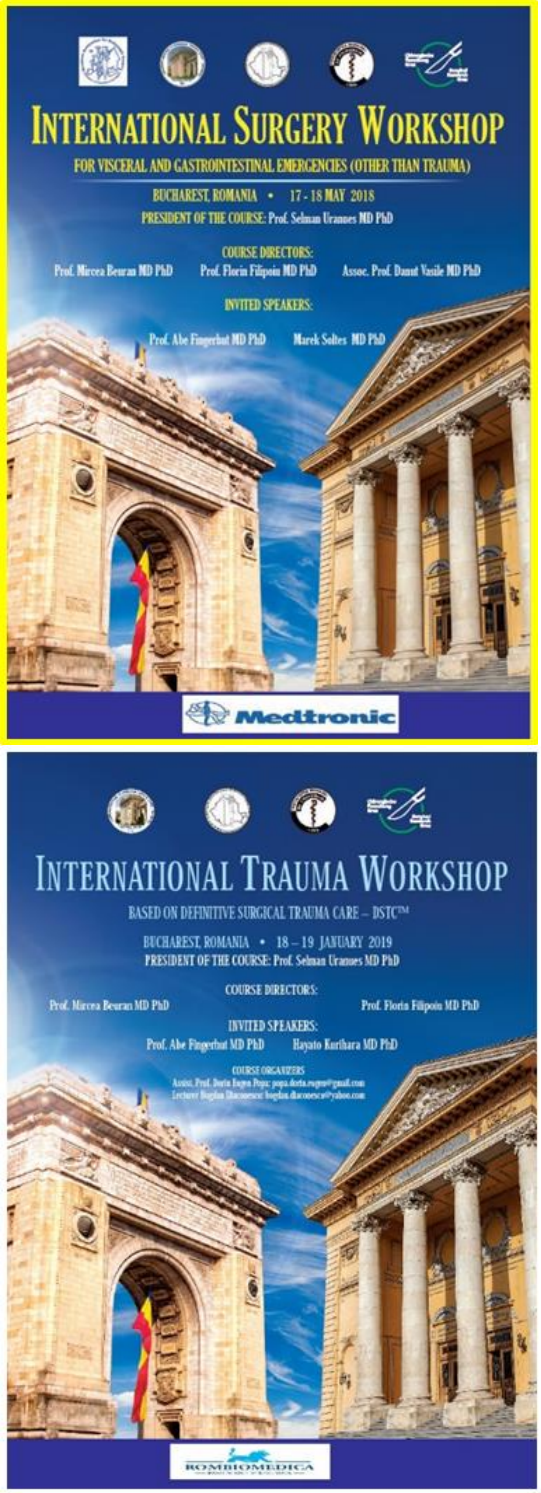

Fig.5. International Workshops in Bucharest

Discussions

In the early 1960s, our clinic was among the few surgical services which used diagnostic laparoscopy. Laparoscopies were performed with a Pergola laparoscope (11 mm diameter), using a quartz rod for illumination, introduced through a supraumbilical trocar. The pneumoperitoneum was obtained by blowing atmospheric air with the help of a rubber pear through a Palmer needle introduced in the peritoneal cavity, under local anaesthesia, at the level of the left iliac fossa (8,10). The thesis of dr. Popovici analysed 134 cases of acute abdomen explored laparoscopically, with 84 laparotomies and 49 cases treated conservatively. Following research on PubMed, we found only six articles about diagnostic laparoscopy in the period 1956-1970; thus, the merit of the two Romanian surgeons is significant (30-35). Due to technical difficulties and complications and to the emergence of puncture lavage, ultrasound and computer tomography the technique was abandoned all over the world, with small exceptions (for example the former USSR), being resumed with the medical TV mini-camera.

In December 1993, after a first laparoscopic cholecystectomy performed by a mixed team, the following three cases (including a case of acute cholecystitis) were performed by A.E. Nicolau, D. Venter, M. Florin and the anaesthesiologists Rodica Florescu and M.Vasilescu. The surgical interventions were performed using an “Olympus OTV3” video line, a small monitor, a halogen light source, a Wisup semi-automatic insufflator (“high flow” manual, max.3l/min). In the first three months, the sterilisation was performed in boxes with formol for 12 hours. The laparoscopy line was won by A.E. Nicolau, as project director (there were 8 projects), after the laparoscopy internships in 1992, in Belgium (Imeldaziekenhuis, Bonheiden, dr.F.de Weer) and Switzerland (CHUV Lausanne, professor G. Chapuis, dr. J. F. Cuttat), where he graduated from a laparoscopy course and participated in laparoscopic surgeries (cholecystectomy, Nissen-Rossetti fundoplication, lumbar sympathectomy). Laparoscopy was accepted and encouraged by dr. A.I. Bucur, the hospital manager and by professor M. Ciurel, but it was not agreed by professor Gh. Ionescu.

In 1998, at the initiative of dr. A.I. Bucur, our hospital managed to buy laparoscopic lines with the help of sponsors. Thus, there is a line for each of the three clinical wards, and one for the emergency department, increasing the number of parallel interventions, as the number of surgeons increased.

Our first laparoscopy article was published in 1995, in a supplement of the “Romanian Journal of

Gastroenterology" dedicated to laparoscopy; this supplement was due to professor S. Duca, the pioneer of the Romanian laparoscopy. Our article presented the laparoscopic cholecystectomy technique, the way we still perform it today, a version of "the french technique" (Dubois) taken over from "Saint Joseph" Hospital in Liège (36).

The percentage of articles about emergency laparoscopic surgery we published in "Chirurgia" Journal (38.09%) is significant. The main subjects we approached were perforated ulcer and abdominal trauma, including two technical articles. Three of our published articles were cited in the bibliography of some chapters of reference books in the domain (37-39). One of the articles has 23 citations (7,15).

Specialised courses became one of the primordial objectives of the SCUB team. In 2008, at the first international course in Iasi, professor R. Bergamaschi (USA) and professor B. Navez (Belgium) sent representatives to present their works. The course had 34 attendees (resident physi cians and surgery specialist physicians) and was structured in theoretical presentations, videos ("how I do") and practical exercises on the pelvitrainer with pork organs. The course was possible with the help of "Temco" ("Olympus" representative) and "Rombiomedica" for mechanical sutures. The courses organised by "Carol Davila" University of Medicine and Pharmacy also involve emergency laparoscopic surgery, both the trauma and the non-traumatic abdominal emergencies, with practice on pigs. Some of the lectors are A. Fingerhut (Poitier, France), A. Leppaniemi (Helsinki, Finland), H. Kurihara (Milano, Italy), M.Soltes (Kosice, Slovakia). Each course is designed for 20 trainees. Because of the scientific and educational level, these courses are recommended by ESTES. Also, Romania was honoured to organise the 18th ESTES Congress (18th European Congress of Trauma & Emergency Surgery, 7–9 May, Bucharest). The president of the congress was professor M. Beuran. There were over 160 speakers who had many presentations about emergency laparoscopic surgery (26).The majority of the emergency laaproscopy papers, videos and posters presented at the congresses EAES, ESTES, EATES, have authors from EHB. The 23th EAES Congress, held in Bucharest, the president was Assoc. Prof. C.Copaescu.I am a member of EAES since 1995, a member of EATES since 1999 and ESTES from 2007.

Compared to 2013, the total number of classic and laparoscopic interventions in 2018 meets a decrease; laparoscopic interventions meet an increase of 6.17% and the emergency laparoscopic surgeries achieve a slight reduction of -3,97 %. The decline of the number of operations is the result of the emergence of private hospitals with well-equipped surgery wards and staff with skills in laparoscopy, which take over a part of the cases. Unfortunately, the budgetary restrictions make difficult the replacement of used instrumentation and the purchasing of new laparoscopy kits, which is reflected in the number of surgeries practised and their diversity, especially in emergency services. Some surgeons do not approach emergency laparoscopic surgery because of the lack of experience, except for acute cholecystitis. A major problem remains the training of resident physicians for emergencies, especially regarding trauma. Establishing a competence for trauma and emergency surgery that also involves laparoscopy, based on the course (theoretically and practically) with graduation exam, could be a solution.

Emergency surgery remains the main challenge of any surgeon, and emergency laparoscopic surgery is a consistent part, which implies appropriate equipment in the hospital, a good collaboration in a large team and a medical team with experience in surgical laparoscopy and emergency surgery. The effect is given by the private medical practice, both for the patient, postoperative comfort and recovery and for the economy of the hospital and the medical assurance system.

Through its team of surgeons, EHB was and still is at the forefront of emergency surgery and implicitly of emergency laparoscopic surgery.

Author's Contribution

A.E.N.designed the study and wrote the manuscript.

Conflict of interest

None declared

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