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A THORACIC SURGEON'S TALE OF TWO CITIES

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When I was accepted into this Association more than 40 years ago, all the members were North American. It was a privilege then to receive that acceptation. It is an even greater one to be called today an honored speaker. For this, I am truly grateful.

The day Dr. Castañeda invited me, I accepted immediately and I confess to having been at the same time surprised and thrilled. As the days went by, both the thrill and the surprise gave way to a mixture of worry and the opposite of weightlessness: gravity. I realized that it was a great responsibility to all of you and to Dr. Castañeda in particular. What on earth could I talk to you about? Any contributions of mine in thoracic surgery are local ones and not international, but to quote Shakespeare: "Extreme fear can neither fight nor fly, but coward-like with trembling terror die."[1] I ended up then by thinking that half a century of one's professional life must encompass a few highlights to be remembered and told. So I embarked on this Guatemalan healer's tale.[2]

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After attending the Massachusetts Institute of Technology and Harvard Medical School, I took my residency in surgery at the Massachusetts General Hospital. At that time there were "assignments" on the surgical service but no department of thoracic surgery. The aim was to prepare general surgeons—an endangered species nowadays if I ever saw one. Those 13 Boston years are unforgettable, and more quality one cannot hope to see. Outstanding thoracic surgeons of that era are recalled and must be mentioned briefly with admiration and gratitude.

Dr. Edward Churchill was a profound thinker and a pioneer in pulmonary and thymic surgery. His rounds were a model of bedside teaching. Dr. Robert Linton was innovative in the treatment of portal hypertension and of bleeding esophageal varices. He tackled cases that had been abandoned by other surgeons. He got into trouble but always managed to come out with flying colors.

And then there was Dr. Richard H. Sweet, my admired patron and friend. His judgment, elegance, and dexterity were paralleled by his statistics.[3] Esophageal surgery was on his daily heavy schedule with pulmonary resections and I never saw an anastomotic leak or a bronchial fistula in his patients. Being asked to help him when he made movies of his high esophageal resections was a flattering enjoyment. However, nobody is perfect. When Dr. Clarence Crafoord from Sweden visited

the Massachusetts General Hospital right after World War II, he pointed out to me that it was not good for a patient to make the effort of breathing while in the lateral decubitus position instead of having a machine do the work.

I first saw controlled respiration at Sabatsberg Sjukhus when I later visited Dr. Crafoord. His contributions to patent ductus and aortic surgery are recognized but not those to anesthesia: He had installed an electric pump connected with ordinary plumbing tubes to several anesthesia machines where intermittent pressure was transmitted to the ventilatory circuits.

During that and the following year I visited some of the renowned thoracic surgical centers of North America and Europe. I was especially impressed by and hoped to emulate Dr. O. T. Clagett, who made all procedures look easy; he also pointed out that not all paresthesias in the arms were to be treated as thoracic outlet syndrome.

Mr. Ronald Belsey showed me good respiratory physiotherapy, which was not available at the Massachusetts General Hospital at that time. He had introduced segmental pulmonary resections with Dr. Churchill and he contributed greatly to the improved management of hiatus hernia[4] since Nissen's procedure had been forgotten, although it later was revived.

Dr. Evarts Graham was an able general surgeon and modest when he gently told me of the first individual ligation pneumonectomy. His thoracic clinic was like a "must" of Cartier, as was Dr. Alfred Blalock's, whose operation was prolonging the lives of blue babies with pulmonary-subclavian anastomoses. Progress was being made by these and other important thoracic surgeons: the spectacular Dwight Harkin, John Gibbon, Robert Gross, John Streider, Henry Swan, Norman Shumway, and John Kirklin, to name but a few. However, my wall of fame is meant to pay tribute to those chest surgeons who contributed directly to my preparation for that important next step: the emancipation from "residentitis" and the return to Guatemala. One last tribute I wish to pay to Drs. Henri Le Brigand and Charles Dubost,[5] who were responsible for the renaissance of French pulmonary and cardiovascular surgery.

The second part of my presentation will be a small memory box of what I consider memorable cases in the past 45 years in Guatemala, a place of unfavorable reputation in the media until recently, even though we are not alone. George Bernard Shaw[6] once wrote: "You dare not handle high explosives, but you are all ready to handle honesty and truth and justice and the whole duty of man, and kill one another at that game ... what a world!" Mark Twain[7] also said: "Often it does seem such a pity that Noah and his party did not miss the boat."

I like to think of Guatemala as a land of great natural beauty (Fig. 1), with proud and colorful descendents of a culture that flourished 2000 years ago, when it would have been justified to call the area on which we stand today the third world. Guatemala's first University of San Carlos was founded in 1631 in Antigua. Guatemala is also the country of good painters and of two Nobel Prizes, one in literature and one in peace. It is also the country of origin of two thoracic surgeons before you: one outstanding, the other standing low!

Last but not least, 46 years ago Guatemala was a land of opportunity for a Boston-trained chest surgeon. I did find some obstacles and surprises nevertheless: Surgical instruments were boiled (and we live 5000 feet above sea level), and talcum powder was used on gloves and hands. Several operations were done in one room simultaneously and anesthesia was given by a practical nurse with a prehistoric paper bag Ombredanne machine. The depth of the patient's anesthesia was guided, I suspected, by the depth of the cyanosis. We soon received good help from friends at the Massachusetts General Hospital. An exceptional ward nurse and an excellent nurse anesthetist came down. How brave and helpful they were!

I was named chief of surgery in a tuberculosis hospital, but there were no chest instruments, no residents, and no blood bank. For our first lobectomy our light source was a gooseneck lamp, and we used one unit of imported plasma.[8] The patient and the surgeon recovered uneventfully. We eventually organized the hospital, substituted manioc powder for talcum, and founded a blood bank. Our first pleuropneumonectomy was carried out in 1949 on a 20-year-old woman with active tuberculosis, a mixed empyema, a bronchopleural fistula, and a bleeding right lung. When she was seen in 1993 at age 65 years, her deformity was adroitly hidden by her dresses. Another memorable pneumonectomy was done in 1949 for tuberculosis on a 10-year-old malnourished boy with a destroyed left lung. His most recent chest film was taken in 1994 at age 55 years. He is the father of five healthy children and works as a messenger at our medical school.

Resections were innovative for tuberculosis at that time. Streptomycin had only recently arrived.

Fig. 1. Lake Atitlan in the highlands of Guatemala.

But not all patients with pulmonary tuberculosis were treated with extirpation. Many with bilateral active disease and cavities had thoracoplasties, extrapleural plombage, phrenic paralysis and pneumoperitoneum, besides pneumothorax. Some of our operations were done with local anesthesia and others under controlled hypotension[9] so as to decrease blood loss in a hospital without a blood bank. The great majority of our patients had advanced disease. Many had complications of pneumothorax such as empyema and bronchopleural fistulas or had huge cavities that necessitated the so-called Monaldi speleotomy or Schede thoracoplasties. By 1965 we had done around 200 thoracoplasties and 225 pulmonary resections with acceptable results. The two deaths were due to pulmonary edema. This was a time without volume ventilators or positive end-expiratory pressure. The one patient with a bronchopleural fistula was a woman of 40 years who entered the hospital drowning in massive hemoptysis. An emergency left upper lobectomy was carried out with a Carlens endotracheal tube and a tourniquet (the only time I ever used it). An intrapleural catheter was left in place for several days and the leak appeared on the fourth postoperative day. It was not closed satisfactorily at a second operation, but she is in good health 25 years later with a small bronchocutaneous fistula, although she is not allowed to go swimming or to smoke.

When I left the Massachusetts General Hospital in 1947 the only so-called cardiac surgery I had seen was closure of patent ductus arteriosus. During the following years gigantic steps were reported at the annual meetings of this Association. This was the time of mitral valvuloplasties (with the finger), pulmonary azygos anastomoses for recurrent hemoptysis in mitral stenosis, attempted closure of atrial defects, aortopulmonary anastomosis for tetralogy of Fallot, and lateral cerebral ventricle–to–vena cava decompresion for hydrocephalus.[10] The last-mentioned procedure was done on an infant, with the help of a nipple filled with sugar, Guatemalan rum, and deodorized tincture of opium; local anesthesia was used for the craniotomy, and the chorioid plexus was cauterized with our thoracoscope.

This was also the time of experimental work in a modest laboratory with cross-circulation and cardiac arrest, hypothermia, and a gastric valve to prevent reflux esophagitis.

Economic limitations, insufficient referrals, and political factors prevented the establishment of open heart surgery. We did do four open corrections of congenital pulmonary stenosis with hypothermia.[11] The successful outcome in the four patients was reported locally. Cooling down to 29° C was done in an old bathtub, circulation was interrupted for an average of 2 minutes, 30 seconds without

sequelae, and one of these four children operated on in 1959, now the healthy mother of four, was seen recently.

In Benedict and Nardi's book[12] and that of Terracol and Sweet[3] on the esophagus, it was emphasized that stretching the length of the esophagus is difficult. Nevertheless, stretching is seen spontaneously in the corkscrew esophagus and the following case will illustrate this point.

A Salvadorean woman, aged 60 years, had been treated for dysphagia in Philadelphia, where she had had a hiatal hernia repair. She had been given a mercury bougie, which she used about once a week for 25 years. When I first saw her, she stated that the bougie was no longer effective. X-ray films and an esophagoscopic examination showed a firm low stenotic lesion. This was treated with a Heineke-Mikulicz esophagoplasty and Nissen gastropexy.[13] The dysphagia disappeared and she was well for 10 years until new symptoms were reported. X-ray films and endoscopic examination showed no obstruction but important motility changes in the entire esophagus; because of these findings plus some telangiectasis, joint calcifications, and skin changes, the diagnosis of scleroderma of the CREST variety (calcinosis cutis, Raynaud's phenomenon, esophageal dysfunction, sclerodactyly, and telangiectasia) was made. She has been treated successfully with cisapride, omeprazole, penicillamine, and gold salts; she is active after hip and knee replacements and she gave me her old bougie as a souvenir.

Cancer of the esophagus and of the stomach are fifth and fourth in statistical frequency in the Cancer Institute of Guatemala. A 63-year-old woman had a transthoracic total gastrectomy with an esophagoduodenal anastomosis for that diagnosis in 1968. A subphrenic abscess developed, but she recovered after a volcanic postoperative course. She lived for 22 years and died at the age of 85 years without dysphagia and with no evidence of recurrence.

In 1953, we saw a talented Guatemalan painter, aged 26 years, with progressive orthopnea who had been treated for tuberculosis by an internist for several months. A malignant thymoma was found and removed, but the artist died 9 months later of recurrence. A 6-year-old girl with superior vena cava syndrome, whose x-ray findings were similar, was seen more recently. After tube drainage of the left pleural effusion a thoracoscopy was performed, and the result of the biopsy was malignant thymoma. The mediastinal tumor promptly shrunk with radiotherapy, but two weeks later bilateral axillary adenopathy and a contralateral pleural effusion appeared, together with a left cervical mass. Biopsy results showed Burkitt's lymphoma. She responded surprisingy well to chemotheraphy with bleomycin, doxorubicin (Adriamycin), cyclophosphamide, vincristine, steroids, and methotrexate.

Infestation with *Entamoeba histolytica* is endemic in our region although not unknown outside the tropics.[14] When amoebiasis extends outside the colon it follows the routes depicted in a diagram from a paper presented to this Association in 1966.[14] The liver is a favored location with formation of hepatic abscesses, and from there the chest cavity may be invaded. A pleural effusion is frequent as the inflammatory process progresses under the diaphragm, and the abscesses may perforate into the pleural or pericardial sac or into the lung itself.

Such was the case of a 29-year-old woman who arrived in a coma with jaundice, a temperature of 40° C, bilateral pleural effusions, and a T tube in the common duct. The tube had been placed at the time of a recent cholecystectomy done elsewhere, during which no stones had been found. The chest fluid on culture showed *Pseudomonas aeruginosa,* the empyema was drained, and a computed tomographic scan showed a large hepatic abscess; the immunohemoagglutination test for amebiasis was positive (1:32000), and a direct cholangiogram showed leakage of the contrast medium into the abscess cavity. This was aspirated percutaneously, and after dehydroemetine and tetracyclin for 15 days, the chest tube and T tube were removed. New films showed that the abscess had disappeared in 12 weeks.

Our most unusual amebiasis case was that of a 78-year-old patient with ovarian carcinoma who died of a left amoebic empyema from the perforation of a splenic amoebic abscess.

We designed an algorithm for the management of these patients with hepatic abscesses: We recommend percutaneous needle aspiration with air injection, which serves as contrast medium for easy and inexpensive x-ray follow-up. The necessary antibiotics are used according to the material found and cultured. In the last 83 cases of hepatic abscesses,[15] a cure has been obtained without intrapulmonary extension, open surgery, or deaths.

Montezuma's revenge is rather well known to North American visitors in Mexico, including ex-President Carter, but few know of Tecún Umán's revenge: When the Spaniards invaded Central America, they were greeted by the local Indians with friendly gifts at the time of Columbus' first voyage.[16]

Tecún Umán is said to have been the last Mayan to defend his land when the invaders became aggressive. He lost, but one of his favorite gifts was tobacco cigars (Fig. 2). I like to call tobacco Tecún Umán's great revenge.

The Mayans cultivated and used tobacco for social, medicinal, and hallucinogenic purposes, and sometimes as enemas. This has been beautifully illustrated in a book by Dr. Francis Robicsek.[17] The Europeans took the plant back home, and we know only too well how successful Tecún Umán's revenge has been throughout the world.

Our experience with cancer of the lung is a sad one. Most of our patients are seen when the disease has metastasized. Occasionally, as in Dr. Graham's first patient, we find a favorable result: A teacher, aged 55 years, had a right upper lobectomy for bronchogenic carcinoma in 1975; his most recent chest film in 1994 shows a most impressive mediastinal deviation, but he is free of recurrence 19 years after the operation and leads an active life.

Cigarettes are unfortunately popular in Guatemala, particularly among young persons, thanks to the undesirable results of propaganda attached to sport events. We have made a lifelong personal campaign against smoking. In my office, for example, is a Brazilian poster for that purpose. It reads: "The earth has 50 oceans, 13 seas, 5 continents, 148 million km^2. With so much space in the world, why did you have to choose this place to smoke?"

At the time of my training at the Massachusetts General Hospital, Dr. Edward Benedict was the only endoscopist: he did all the bronchoscopies, esophagoscopies, gastroscopies, and peritoneoscopies. Sclerosing treatment of esophageal varices was also carried out. When Dr. Benedict was absent (and he was gone for almost a year), I was lucky enough to do all the endoscopies at the hospital.

Like many things in medicine, thoracoscopy is not new, was forgotten, and was rediscovered. You will remember that the thoracoscope was originally used to cut adhesions and so improve lung collapse during the treatment of pulmonary tuberculosis with pneumothorax. Our old apparatus was never discarded and it was used occasionally during the past 45 years for diagnostic purposes. With the advent of modern endoscopy instruments, the visibility is of course much improved, but we still use parts of our old faithful instrument, such as in the following case: A 70-year-old woman who had a left breast resection for ductal carcinoma 3 years earlier began having pain in the right side of the chest. A right

Fig. 2. A vase from the ninth century depicting a Mayan chief smoking a cigar.

pleural effusion was found, and thoracentesis yielded a straw-colored fluid. A Papanicolaou smear of the fluid and a study of the cell block showed no malignant cells, but a thoracoscopic examination with the patient under local anesthesia showed mediastinal and diaphragmatic white plaques. The pathologic specimens were identical to the original breast lesion. Intrapleural injection of cyclophosphamide was done and she has since been treated exclusively with tamoxifen. Her last film 18 months after thoracoscopy showed no reaccumulation of fluid, her carcinoembryonic antigen level is low, and she works as director of a high school.

In the Palais Royal gardens in Paris stands a tiny cannon built in 1786 by a watchmaker named Rousseau. It includes a magnifying glass for the sun to detonate it daily at noon. A legend is engraved which says: "Horas non número, nisi serenas" ["I only count the happy hours"]. I also like to recount my good results and moments, and because I have a selective memory I forget the bad ones. I believe that at my age it may be the secret for feeling happy.

Now I come to the recent past, which includes the last 16 years of this tale.

A great satisfaction comes from sharing one's

Fig. 3. The new medical school founded by the Foundation Chusita Llerandi de Herrera and the University Francisco Marroquin.

knowledge and experiences with younger generations. Here I disagree with George Bernard Shaw when he writes, "Reminiscing makes one feel so deliciously aged, and sad."[18] Helen Hayes, that great lady of the American theater, on the contrary said: "Don't rest, you will rust." Mickey Rooney also adds: "Don't retire, inspire."

Teaching and organizing medical education at the student and postgraduate level in a third world country is more important than performing successful operation. I believe there should be no age limit for compulsory retirement in the field of medical education, so long as the brain keeps working without short circuits!

In 1977 a few colleagues and I decided to start a new medical school when we noticed a decline in the quality of the graduates from the only other existing medical school in Guatemala. There were no entrance examinations, exams could be repeated ad infinitum, and classes of 2000 became the rule instead of 100 usually in the past. A young Francisco Marroquín University had been recently founded by a group of enthusiastic and clever entrepreneurs and we asked for their patronage. A Guatemalan Foundation named after my mother, from whom I had inherited some land, offered the funds for the construction. On this piece of land a private hospital had previously been built, and the patients and equipment could be used, we thought, for teaching as in the CHUs in France.

We visited several community-oriented medical schools in the United States and Canada and we adapted their curricula to our local idiosyncrasies and needs. A document for cooperation was signed by University Francisco Marroquín and Foundation Chusita Llerandi de Herrera in 1977, the new medical school opened its doors the following year (Fig. 3), and a new University Hospital is being built at the present. Ours is a 7- or 8-year curriculum, because in Latin America students usually apply directly after graduating from high school. This is responsible for a high desertion rate of 30% during the first 3 years, but desertion is most unusual during the last 4 years.

A special part of our curriculum should be mentioned: During 4 months before their last year, our students are sent to an Indian rural area covering a population of about 70,000. The students live in that San Juan community and offer primary care to the population as well as hygienic instruction to health promoters (barefoot doctors with sandals!). In the past 10 years, maternal and infant mortality have been reduced and vaccination reaches almost 100% of the pediatric population. This program has attracted exchange students from medical schools in the United States, Canada, and Europe. It has also

opened opportunities for reciprocal electives abroad for our own students, and we have been satisfied with the favorable reports received about their performance before and after graduation. Thoracic surgery is taught by surgeons with postgraduate training in the United States, France, and Great Britain.

Obtaining residencies abroad, especially in the United States, is most attractive to our graduates and that is understandable. However, two undesirable consequences must be pointed out and commented on: First is the immediate loss of good needed manpower in our hospitals at home. Second and worse is the possibility of permanent loss of well-trained physicians for our country through "brain drain." This is sometimes justified but always regrettable.

These problems have a solution: that our graduates do their residencies at home and that they go abroad later and only for a short duration of what I call a "period of refinement" in special fields. I believe that we need help from North American hospitals with this in mind, and I respectfully ask you for this help: be very selective when it comes to Guatemalan candidates for residencies, and be very generous when the request is for a year or so of fellowships.

I hope to have entertained you with this "thoracic tale of two cities" mixed with "the past recaptured." May Dickens and Proust and you forgive me if I failed. But to quote Marcel Proust[19] himself: "The happy one is, when all is said, he who takes trouble, goes on a journey, executes a mission [and] feels no anguish in his heart."

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