# **Clinical innovations in Philippine thoracic surgery**

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**Abstract:** Thoracic surgery in the Philippines followed the development of thoracic surgery in the United States and Europe. With better understanding of the physiology of the open chest and refinements in thoracic anesthetic and surgical approaches, Filipino surgeons began performing thoracoplasties, then lung resections for pulmonary tuberculosis and later for lung cancer in specialty hospitals dealing with pulmonary diseases—first at the Quezon Institute (QI) and presently at the Lung Center of the Philippines although some university and private hospitals made occasional forays into the chest. Esophageal surgery began its early attempts during the post-World War II era at the Philippine General Hospital (PGH), a university hospital affiliated with the University of the Philippines. With the introduction of minimally invasive thoracic surgical approaches, Filipino thoracic surgeons have managed to keep up with their Asian counterparts although the problems of financial reimbursement typical of a developing country remain. The need for creative innovative approaches of a focused multidisciplinary team will advance the boundaries of thoracic surgery in the Philippines.

Keywords: History; thoracic surgery; developing country; Philippines

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## Early attempts at opening the chest

On July 10, 1919, Dr. Carmelo Reyes, a member of the surgical staff of the Philippine General Hospital (PGH), excised a huge chondrosarcoma of the left anterior chest wall in a 47-year-old laborer. "The ribs were porous and brittle," Dr. Reyes wrote, "and yielded to the manipulation without much effort. The resection naturally exposed the chest cavity, bringing the pericardial sac and its content into view... The window-like opening into the chest cavity was closed with much difficulty by means of rubber sheets and a tin plate over them, secured by silkworm stitches" (1). Three days later, the patient died following a rise in temperature and a rapid and difficult respiration.

The first recorded thoracic operation in the Philippines covered only two pages in the September 1925 issue of the *Journal of the Philippine Islands Medical Association*. Subsequent surgical incursions in the thoracic cavity were few and far between. Dr. Cristino Lazatin, a pioneer cardiothoracic surgeon of the PGH, mentioned the removal of a slug in the lung of a patient under local anesthesia by the Filipino pioneer surgeon Dr. Gregorio Singian in the early thirties (2). Albert and Jongco reported 41 cases of empyema thoracis in children from 1936 to 1939 managed primarily with rubber tube drainage; pneumococcus was the causative microorganism in most cases and the mortality rate was 7.31% (3).

During this era, sodium chloride solutions caused fluid retention, blood was transfused directly from the donor to the recipient at times very rapidly resulting in overloading the circulation, sulfonamides and polyvalent antibacterial serum were being given to combat infections and foreign protein and milk were injected to promote the defense mechanisms of the body (2).

Unlike in Europe and in the United States, the specialty of thoracic surgery did not initially find fertile ground in the Philippines. In 1946, Dr. Serafin Menes of the Department of Surgery of the University of Santo Tomas (UST) Faculty of Medicine cited some of the following reasons: lack of a systematic campaign to educate the people and give them reassurance that most surgical chest diseases can be cured if discovered and operated on early; failure of the family physician, internist and roentgenologist to diagnose promptly and accurately early cases of cancer, abscess of lungs, diaphragmatic hernia, etc. and to properly endorse them to the chest surgeons; lack of competent bronchoscopists; lack of properly trained personnel to administer intratracheal anesthesia and lack of proper surgical instruments for major thoracic work (4).

Von Mikulicz, one of the younger Bilroth pupils, realized that opening of the chest collapsed the lung hindering further surgical procedures. In the early 1900s, he developed the rudiments of a negative-pressure chamber with the whole team of surgeons, nurses and instruments, together with the patient in it (5). Meltzer and Auer of the Rockefeller Institute, however, introduced intratracheal anesthesia in clinical surgery which paved the way for rapid advances in chest surgery in the early twentieth century (6).

The occasional performance of chest surgery increased with the burgeoning indications for the surgical treatment of pulmonary tuberculosis. Prior to 1930, treatment for tuberculous patients was largely non-surgical and patients were confined in sanatoria in Europe and the United States waiting for either one of two things: get cured or die. Minor surgical procedures like endoscopic adhesiolysis and artificial pneumothorax gave way to thoracoplasty and finally to lung resection. Some surgeons were finally able to concentrate on TB surgery ("saddleback surgery" as it was then called) and from the surgical standpoint, were able to make a living from it. The thoracic surgical historian Dr. Andreas Naef stated that "*tuberculosis medically and economically established thoracic surgery as a separate specialty*" (7).

## Thoracic surgery and the Quezon Institute (QI)

On December 14, 1918, the Philippine Islands Antituberculosis Society officially inaugurated the Santol Sanatorium in Caloocan, a suburb of the capital city of Manila, which was later transferred and renamed the QI, named after the first president of the Philippine Commonwealth, Manuel Luis Quezon who died of tuberculous complications in exile at the Saranac Lake sanatorium in New York during the Second World War. Its establishment paved the way for the development of thoracic surgery as a specialty in the Philippines as abdominal surgeons and pulmonary physicians found a place to perform various methods of collapse therapy for pulmonary tuberculosis. Pulmonary resection was performed by QI surgeons for bronchiectasis in children (8), for massive hemoptysis (9), for pulmonary tuberculoma (10) and for pulmonary tuberculosis (11).

In 1929, Filipino doctors were performing artificial pneumothorax treatment in selected tuberculous patients after Major Poust of the United States Army demonstrated the operation to the medical staff of the institute (12). The arrival of the Swiss tuberculosis specialist Dr. Andreas Trepp in 1931 saw the introduction of phrenic nerve operations and thoracoplasty (12). Dr. Miguel Canizares, who eventually became medical director of the QI, introduced the Jacobaeus operation, or closed intrapleural pnemonolysis in the Philippines after visiting and specializing in tuberculosis clinics in Europe and the United States. In artificial pneumothorax, treatment failures are caused by pleuritic adhesions between the lung and parietal pleura causing ineffective compression of diseased pulmonary cavities. By severing these adhesions by galvanocautery under thoracoscopic guidance in the Jacobaeus operation, the lung is collapsed more effectively (13). On March 16, 1963, he performed this operation on a young female student with very good results, the first of its kind performed in the country and in the Far East (14).

From 1948 to 1949, Drs. Hebron and Intengan of the National Chest Center of the government-run San Lazaro Hospital performed the modern, multiple stage conventional posterior thoracoplasty on five patients (15). Dr. Hebron was a resident physician in charge of the Surgical Ward and one medical ward of the Rhode Island State Sanatorium from 1942 to 1946; he also had trained under Dr. Richard H. Overholt of the Overholt Clinic in Boston. From 1948 to 1952, pioneer thoracic surgeons Drs. Angel Reyes, Fortunato Guerrero and Enrique Garcia of the QI performed 298 single and multiplestaged thoracoplasties on 157 patients (16). After 1951, less thoracoplasties were done in favor of pulmonary resection which considerably reduced hospitalization. Dr. Enrique Garcia and his group at QI reported lung resections in 269 patients with a 7.8% mortality (17).

Attempts at resection for bronchogenic carcinoma were also done at the QI starting with the first attempt in the middle of 1948; the second attempt was made in the last week of February, 1949. On March 15, 1949, Dr. Angel Reyes performed the first successful total pneumonectomy in the Philippines on a 42-year-old barber with bronchogenic carcinoma. Preoperative induced pneumothorax was done two weeks before the operation

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to allow the heart to compensate for the sudden changes of intrapleural pressure and to determine the extent of the pleural adhesions as a guide for the planned incision (18). In a twelve-year period from 1947 to 1959, 240 cases of bronchogenic carcinoma were diagnosed at the QI (19).

In 1982, most of the staff at QI would eventually transfer to the newly constructed Lung Center of the Philippines (LCP), eventually to become the country's only tertiary medical center for pulmonary diseases where most of the country's thoracic surgical work is presently being done. Among the thoracic surgeons from this institute were Dr. Adolfo Baviera who trained with pioneer cardiac surgeon Dr. C. Walton Lillehei of the University of Minnesota and Dr. Enrique M. Garcia who was eventually to become the Minister of Health. Other thoracic surgeons who eventually ran the LCP included Drs. Alfredo Balderrama, Cesar Millar, Jesus de Jesus, Rogelio Teotico, Fulgencio Francisco and Eleno Mencias.

## The PGH and the university hospitals

The introduction of endotracheal anesthesia and cyclopropane in the Philippines in 1945 spurred the development of the specialty (20). Within a few years, Filipino surgeons were invading the chest cavity and the cranium. At the PGH, the teaching hospital of the University of the Philippines, Dr. Cristino Lazatin reported the first decortication in a patient with traumatic hemothorax performed on September 27, 1949 (21). He also performed the first thymectomy for myasthenia gravis in the Philippines on July 25, 1950 on a patient who also had a thymoma through a median sternotomy (22).

On May 23, 1950, Dr. Lazatin resected the esophagus and part of the stomach of a 48-year-old female with epidermoid carcinoma of the distal third through a thoracotomy incision; reconstruction was through an intrathoracic esophagogastric anastomosis. This was performed under cyclopropaneoxygen-ether anesthesia (23). He also performed the first interposition of the jejunum through a subcutaneous route (24). Dr. Fortunato Guerrero also used the jejunum which he either tunneled through the chest or beneath the skin (24). A general surgeon, Dr. Emilio Horrilleno, also of the PGH, performed the first Wookey operation (two-stage operation resecting the esophagus, larynx and pharynx and subsequent bridging of the gap by a skin tube) for esophageal carcinoma in 1952 (24). On February 22, 1954, Dr. Pedro Lavadia Jr performed an esophagectomy for corrosive stricture from accidental muriatic acid ingestion in a 21-year-old male gold

mine worker using the stomach as an esophageal substitute; he also used the stomach in two other patients (25). He used the colon to replace the resected esophagus in two subsequent cases at the PGH (26).

At the Catholic-run UST, Dr. Pacifico Yap excised a large pulsion diverticulum of the esophagus in 1953, the first reported case in the country (27). The following year, Dr. Clarencio Yujuico operated on a 12-year-old boy with pectus excavatum using the Brown procedure with an excellent result (28). On September 18, 1958, Dr. Serafin Menes reduced the stomach, small and large intestines including the spleen which were found in the left chest of a 4 lb. 10 oz. premature baby girl. The abdominal approach was used to correct the congenital diaphragmatic hernia; the baby survived a stormy postoperative course (29).

At the privately-owned University of the East Ramon Magsaysay Memorial Medical Center, Dr. Constante Firme operated on 27 patients with chest wall defects during a 10-year period caused mainly by the Urban type of radical mastectomy. In his report before the Philippine College of Surgeons in 1967, he used knitted dacron not only in reconstructing these thoracic defects but also in a variety of abdominal wall defects and hernias (30).

It was during this era and also in the university hospitals where cardiac surgery started to flourish when pioneer thoracic surgeons who trained in the United States began to arrive. Cardiac surgery forged ahead when cardioangiography was introduced at the PGH on March 5, 1949 (2,31). Thereafter, the establishment of the Philippine Heart Center for Asia in 1975 (now the Philippine Heart Center or PHC) provided the impetus for the growth of cardiovascular surgery in the country leading to the eventual separation between thoracic and cardiac surgery as distinct specialties.

## Thoracic surgery at the Lung Center of the Philippines

The government-run LCP opened its doors to the public in January 23, 1982. It was created through a presidential decree by then Philippine president Ferdinand Marcos. Its mandate was to serve as the country's training, research and end-referral center for the prevention, diagnosis, treatment and rehabilitation of lung and other chest diseases. It was one of the four projects of then First Lady Imelda Marcos who envisioned a medical complex of specialty hospitals in proximity to each other. The other three were the Philippine Heart Center, the National Kidney and Transplant Institute and the Philippine Children's Medical Center. The other proposed specialty centers did not see the light of day.

From September 27 to 29, 1993, the first video-assisted thoracoscopic surgery (VATS) course in Asia was held at the LCP under the sponsorship of the Endoscopic and Laparoscopic Surgeons of Asia (ELSA) with Professors Robert MacKenna and Rodney Landreneau as course directors. Eventually, VATS for biopsies and other simple thoracic procedures were performed routinely. But in May 16, 1998, fire razed the hospital to the ground and it took another four years to reconstruct half of the original structure. With this setback, thoracic surgical work was derailed for a few years.

In January 23, 2014, the hospital's minimally invasive surgery operating room was opened followed by an exponential rise in advanced VATS procedures. The hospital hosted the first Association of Southeast Asian Nations (ASEAN) VATS Collaboration Workshop in January 24, 2014; it is also part of the ASEAN VATS Study Group. This was followed a few months later by the First Philippine Single Port VATS Symposium and Live Surgery with Professor Alan DL Sihoe of the Chinese University of Hong Kong as the guest surgeon. Today, uniportal and multi-port VATS are performed almost routinely and have outpaced the number of open thoracotomies. Previously open thoracic procedures have been replaced by VATS (32-35). VATS lobectomy for chronic inflammatory chest diseases have also been performed (36). Even innovative cost-cutting methods have been tried (37). Part of the thoracic surgical curriculum is supervised minimally invasive thoracic surgery. Recent graduates as well as senor thoracic surgical consultants attend formal structured minimally invasive thoracic surgical courses abroad.

With the opening of its Esophagus and Swallowing Center at the LCP this year, a resurgence in esophageal surgery and minimally invasive esophagectomy is expected. However, problems of financing new programs in a developing country where health is not the number one priority requires creative and comprehensive approaches involving a multidisciplinary team effort including the nursing staff. In the end, a dedicated team and focused vision can push the boundaries further to advance VATS in the Philippines.

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#### Footnote

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