ABSTRACTS

THE FOURTH INTERNATIONAL CONGRESS ON THORACIC AND CARDIOVASCULAR SURGERY IN CHINA

November 10-12, 1997
Beijing International Convention Center

Chinese Society for Thoracic and Cardiovascular Surgery
CMA

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在欧洲国家，有超过40份临床布告，共收录2,500名病例，验证了本药保护心肌的效应，尤其对进行心脏手术的病人，效果显著，使用本药后心律失常明显减少，自动复跳率增加，病人恢复的进展更理想，是心脏手术中心肌保护的一种崭新手段。

自1980年以来，已经有纪录超过1,500,000名病人使用本药，证明是医师可以放心使用的心肌保护药，能减少进行心脏手术病人由于缺血及再灌注时所引致的心律紊乱，增加自动复跳率，而且保护了心肌的超微结构形态，有助病人恢复。在这过百万病例中，所报导的副作用极少，只发现1例由于快速静脉输注引致轻微低血压，及1例由于肌注引致注射部位疼痛，进一步确定护心通是值得推荐的、安全和可靠的心肌保护新药。

中国临床经验：

95年至97年在北京解放军总医院、北京安贞医院、北京阜外医院及沈阳中国医科大学附属第一医院进行的，共170例有对照临床实验，证明同时使用本药及医院常用的心脏停搏液，显著加强心脏手术中心肌保护的效果，能减少术后心律失常的发生率，增加自动复跳率，在术后心律失常、低心排以及再灌注损伤的防治效果明确；而配合常规治疗方案，治疗慢性心脏衰竭，可减少心律失常，免除由于缺血所引致心肌损害；保护较好的心肌超微结构形态，亦未见副作用，是值得推荐使用的心肌保护药。

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MESSAGE FROM THE ORGANIZERS

Dear Colleagues:

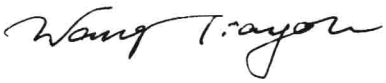
We are honored to present the Abstracts of the papers to be presented at the 4th International Congress on Thoracic and Cardiovascular Surgery in China, held in Beijing November 10 – 12, 1997. The papers were contributed by doctors from 25 countries. The topics are informative and reflect the work that is being done in the field of thoracic and cardiovascular surgery both in clinical practice and in experimental research. To enhance the value of this Abstract Book we have included abstracts of the lectures to be given by our distinguished guest speakers. The information in this book will give you a better understanding of the current development and trends in thoracic and cardiovascular surgery both in China and worldwide. We hope our goal of exchanging ideas and experience will be realized and all the participants will benefit.

On behalf of our society we would like to thank our guest speakers and all the doctors who have come to this congress to share their expertise and experience with colleagues from other contries.

We hope that you will enjoy this congress and find it beneficial. By the way, we hope also you can spare a little time from our busy schedule to see something of Beijing city.

Sincerely yours,

Dr. Zhu Xiaodong
President
Chairmen of Organizing Committee.



Dr. Wang Tianyou
Chairmen of Scientific Committee.

GENERAL LECTURES

G001

CURRENT STATUS OF CARDIAC SURGERY IN CHINA

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This paper is to present an overview of the current status of cardiac surgery in China and traces its developments.

The number of hospitals throughout China performing open heart under CPB is 483, seven fold increase over 1980.

Among the surgical cardiac disease entities, CHD (66%) took the lead, RHD ranked the sceond, while CAD and GAD made up only a small percentage (2 - 3%).

Surgical treatment of complex congenital heart diseases especially in neonate and infant remains a challenge to cardiac surgeon in China although remarkable surgical results of some disease entities have been achieved in recent years. The operative mortality rate for TOF varied between 1.11% - 7.9%; DORV, 7.7% - 16%; Ebstein anomalies, 4.6 - 8.1%; total anomalous pulmonary venous connection, 0 - 7.96%; A - V canal 2.4% - 6.5%; and TGA, 17% - 24%. Favorable results of surgical treatment of complex or severe congenital heart diseases were obatained in neonate and children <3 years old with the mortality of 2.48% - 4.7%.

Closed mitral commissurotomy still occupied a fair share (40.3%) just a little less than MVR (53.5%). But, in recent years, on one hand, priority has been given to open mitral valvuloplasty in some clinics with a success rate of over 80%. MVR (56.6%) is the most common procedure among single heart valve replacement and the AVR comes next. MVR + AVR is performed more often than MVR + TVR. Single TVR (1.3%) or triple VR is rare (0.4%). The mortality rate for valvular replacement varied from 1.2% to 8%, which was slightly higher depending on the severity of valvular lesions and number of valves involved in replacements.

Coronary arterial bypass surgery started quite late in China. The high mortality in the beginning prevented wider clinical application. In last 3 years, however, the mortality rate of CABG gradually came down to 3.6% and then to 1.4%.

Great artery surgery is mainly confined to aneurysms of thoracic aorta especially dissecting type. The operative mortality for various type of thoracic aneurysms varied from 8% to 10.2%.

The total number of 16 cases of heart transplantation were performed. throughout the country from 1978 - March, 1997. There were 7 early postoperative deaths, 4 late deaths. Among the survivors, 1 lived >5 years, $1>3$ years and 2 months, $1>1$ yerar and 7 months, $1>1$ year. The causes of deaths were attributed to operative factors, acute or chronic rejection, infection.

Clinical application of dynamic cardiomyoplasty had been delayed because of the availability and quality of electronic stimulator. This problem has been solved and Dr. Wang TY has done 3 cases with fairly good early postoperative results as indicated by improvement of the hemodynamic parameters.

Up to the last March, transmyocardial laser revascularization was performed as an alternative treatment of CABG in 17 cases and as an adjunct in 21 in Beijing and Harbin. There was one postoperative death. Relief of angina was experienced in 31 cases and improvement of angina in 6. Further observation is needed to verify the long - term effect.

G002

CARDIOVASCULAR OPERATIONS IN FU WAI HOSPITAL 40,000 CASES

Zhu Xiaodong, Shang Hua, Xiao Mingdi, Wu Qingyu, Liu Yinglong, Hu Shengshou, Dong Chao
Dept. of Surgery, Fu Wai Hospital, PUMC, CAMS, Beijing, 100037 *China*

In the past 41 years, 41,648 cardiovascular operations had been performed in Fu Wai Hospital. The analysis and evaluation of the operations will be helpful in understanding the history and current status of cardiovascular surgery in China.

Since 1980, both the operation amount and the percentage of open－heart operation have been increasing rapidly. In 1996, more than 3,500 cardiovascular operations were performed in this hospital with 1.13% operative mortality. The composition of the operations is 66% for congenital heart diseases (CHD), 24.4% for valvular disease, 2.8% for coronary heart disease, 1.3% for aortic aneurysms and 2.2% for tumors, trauma, cardiomyopathy and endocarditis.

CHD: In the 27,482 operations for CHD, 75.3% were open－heart operations. Eighty percent of the open－heart cases were acyanotic with a mortality less than 1%. In the cyanotic cases, there were 3,443 cases of Tetralogy of Fallot (TOF) with 8.3% operative mortality. In the last 700 cases, however, the mortality was 2.2%. The mortality of the 690 cases of complex CHD (TGA, PA, DORV, A－V cannel) was 33.2% and that of the 338 cases performed in the recent 3 years was 17.5%. The percentage of children under 3 years old in the CHD group was 13.8% and is about 30% now.

Valvular Surgery: The percentage of valve replacement, valvular plasty and closed mitral commissurotomy (CMC) was 61.4%, 7.7% and 30.9% respectively. CMC was performed mainly in the 60s and 70s and had been replaced by percutaneous balloon mitral valvuloplasty (PBMV) in the 90s. Most of the valvular plasty was mitral, the second was tricuspid and the aortic was rare. Mitral replacement, double－valve replacement and aortic replacement was 61.4%, 23.2% and 15.3% respectively in valvular replacement. The average age of the patients underwent valvular replacement was 35.2 years old in the early 80s. That age raised up to 44.9 years old in last year with the mortality of 1.2%. Before 1985, the majority of the prosthesis was biological. After 1986, however, only 1% of the prosthesis was biological.

Coronary Surgery : Although the first coronary artery bypass grafting was performed as early as 1974, only 1,166 cases have been done with a mortality of 5.6%. Ventricular aneurysm was found in 26.5% of the cases. Now, the percentage of coronary operation in this hospital is 8.6% with a mortality less than 2%. IMA and sephenous vein have been routinely used. Twenty－four cases of simultaneous TMR were performed in CABG operations.

Vascular Aneurysms: The operation amount for aortic aneurysms has been increasing and operation mortality dropped down from 12% in the end of 80s to today's 2.1%.

A survey on cardiovascular operations of 189 hospitals in the main land China was carried out in 1996. A total number of 18,774 operations were performed. The proportion of the operations were as the following: CHD 68.1%, valvular diseases 21.2%, coronary diseases 2.6%, aortic aneurysms 0.8% and others 7.3%. About 1,000 CABG operations were performed in 40 hospitals.

G003

THE AMERICAN BOARD OF THORACIC SURGERY PURPOSE – FUNCTION – STRUCTURE

Richard J. Cleveland, M.D., FACS

Surgery. Tufts University School of Medicine and Secretary Treasurer of The American Board of Thoracic Surgery

Formally established in 1947, the Amencan Board of Thoracic Surgery (ABTS) will celebrate its 50th anniversary next year. The reasson for the establishment of this body was the recognition by the surgical leadership that the specialty of thoracic surgery was rapidly expanding and their belief that it was necessary to attest through a formal certification process, the competence of those who performed surgery of the thorax. While the structure and functions of the ABTS have changed, its primary goal has not. The primary purpose and most essential function of the ABTS is to protect the public seeking surgical care of diseases of the chest. This is accomplished by assuring through its certification process that its diplomates have the knowledge, judgment, and skills necessary to provide such surgical care of the highest quality.

The ABTS accomplishes this by the administration of a two step examination process. First a criterion referenced multiple choice written examination designed to test the candidates' cognitive knowledge is administered annually at a single geographic location. Once having successfully passed this examination, an oral examination is administered which encompasses the entire field of cardio – thoracic surgery. The prupose of this examination is to evaluate the candidates skill in problem solving and clinical judgment. Atfer successful completion of this process the candidate is certified as a diplomate of the ABTS and provided with a time limited certificate. In order to maintain valid certifcate a diplomate must successfully complete the ABTS administered recertification program at 10 year intervals.

There are strict criteria that an applicant must meet in order to enter the certification process. The applicant must posses a medical doctor degree and be licensed to practice medicine in the United States. In addition, the applicant must have successfully completed a training program approved by the Accreditation Council for Graduate Medical Education (ACGME) on the recommendation of the Residency Review Committee for Thoracic Surgery. Finally the applicant must be certified by the American Board of Surgery. The exarminations are prepared and administered annually by the Directors of the ABTS. Currently there are 17 Directors who are elected from nominees forwarded by seven of the leading surgical societies in the United States. Each Director serves a six year term. In addition, there is an administrative staff and psychometric support. The latter provides statistical validity to the process.

Over the past 50 years there have been approximately 6000 candidates who have been certified by the ABTS. Currently approximately 4000 possess valid cerfificates and are clinically active. In the United States certification is essential for surgeons who seek institutional approval to perform cardio – thoracic surgery. In the future the methodology of certification may change but the primary goal of the ABTS will remain constant.

G004

THE BIRTH OF OPEN HEART SURGERY

C. W. Lillehei

Professor of Surgery. University of Minnesota Medical School, Minneapolis, Minnesota, USA.

A physician at the beside of a child dying of an intracardiac malformation as recently as 1952 could only pray for a recovery! Today, with CPB, correction is routine.

Thus, open heart surgery has been widely regarded as one of the most important medical advances of the 20th century. Today, its application is so widespread (2,000 such suigeries performed every 24 – hours worldwide), and it is performed so effortlessly, and with such low risk at all ages from neonates to octogenarians that it may be very difficult for the current generation of cardiologists and cardiac surgeons, much less the lay public, to appreciate that

just 41 years ago, the outer wall of the living human heart was an impenetrable anatomical barrier to the surgeon's knife and to the truly incredible therapeutic accomplishments that are so commonplace today.

These past 41 years have seen spectacular progress in the development and application of methods for the diagnosis and correction of all types of congenital and acquired cardiac conditions. For those few not correctable heart replacement by Barnard and Shumway became a reality beginning in 1967.

The keystone to this astonishing progress has been the development and refinement of methods for CPB which have allowed surgeons to empty the heart of blood, stop its beat as necessary, open any desired chamber, and safely carry out reparative procedures or even total replacemet in an unhurried manner. This technology has been greatly facilitated by the added use of hypothermia, and by hemodilution.

Beginning in 1951, a number of the developments that made clinical open heart surgery possible and successful occurred in the Department of Surgery at the University of Minnesota (table).

Table. Original open－heart operations and technlques deveioped and first applled at the University of Minnesota, 1952－1957

Operation/Technique	Date*	Technique
Atrial (secundum) septal defect closure	9/2/52	General hypothemia
Ventricular septal defect closure	3/25/54	Extracorporeal circulation (by cross cilrculation)
Atrioventricularis communis correction	8/6/54	Same as above
Tetralogy of Fallot correction	8/31/54	Same as above
Disposable bubble oxygenator	5/13/54	
First use of direct cardiac attmulation by myocardial Electrode(a) with a pacemaker for complete heart block		

* Dates indicate first successful use in patients

The DeWall－Lillehei bubble oxygenator of 1955 was an instant success, wherever it was used because it had so many practical advantages, It was efficient, inexpensive, heat sterilizable, easy to assemble and check, had no moving parts, and was disposable. The development by us a year later of the commercially manufactured, selfcontained uninized sheet oxygenator further improved the ease of use and played an important role in the explosive expansion of open heart surgery that occurred after 1956.

Beginning in 1956, we began the routine use of the open approach to all forms of acquired valvular lesions requiring commissurotomies, mitral annuloplasties or other reconstructive procedures. In 1958 the aortic valve was totally replaced successfully. Routine aortic and mitral valve replacements did not thrive until the advent of the more reliable ball valve prostheses in the early 60's.

Thus, CPB revolutionized the surgeons' treatment of acquired valvular diseases as it had done for congenital heart disease.

The late 60's saw the perfection of effective myocardial revascularization procedures by Johnson and Favaloro.

Thus, the road to the application of CPB to all forms of heart disease, which was just a dream 41 years ago, has been completely opened with enormous benefits to mankind.

G005

THE SURGERY AND SOME RELATED PROBLEMS OF MARFAN'S ANEURYSM

Sun Yanqing, Xie Jinsheng, Li Chao, Zhou Qiwen, Chen Yingchun
Department of Cardiovascular Surgery, Beijing Heart, Lung and Blood Vessel Disorders Research Institute, An Zhen Hospital, Capital University of Medical Sciences, Beijing, 100029 *China*

The poor natural pragnosis and very high early mortality in the Marfan syndrome results primarily from complications associated with aortic root aneurysm c/s dissection. The treatment for aortic root aneurysm with aortic regurgitation or aortic dissection has been fraught with difficult general and surgical problems many years. For the most part were resolved in 1968 with the introduction of a technique of total replacement of the ascending aorta by a composite valve conduit graft and reinplantion of the coronary arteries by Bentall & Debono, in 1981 a modified Bentall's operation – – Cabrol procedure described by Cabrol & Pavie, and later on a lot of variant modified procedure appeared. These techniques are of their advantages but still exist a certain risk and unsatisfactory. As a genetic disease, the systemic management for Mrafan syndrome is still remained.

In 1990, Kanulainen et al proved that Marfan syndrome is autosomal dominant disorders of connective tissue, which defect gene located on 15q21.1. It is very helpful and benefits for the accurate diagnosis and general management for Marfan syndrome, and as well as in the field of prevention.

Analysis results of 143 Surgical cases for aortic Root Aneurysm c/s Dissection due to Marfan Syndrome

From march 1985 to April 1997, the data of 143 consecutive patients with ascending aortic root aneurysm and aortic insufficiency of Marfan syndrome (one with bicuspid aortic valve) operated by the senior of us (Sun YQ) were analyzed. The diagnoses of their aortic lesions were made preoperatively by Doppler B ultrasound color echocardiography, identified during surgery, confirmed by Pathological section, and partially by FBN1 genetic analysis.

129 cases operated with Bentall procedure, 5 with Cabrol's, 9 with modified Wheat's were included in this 143 cases. Emergency operation was performed on 3 acute cases and selective operation was done on 140 cases . 67.42% with intimal tear and dissection. Mild to moderate mitral regurgitation determined by Doppler ultrasonic color echocardiography was present in 18.07% of the patients. However, intra – operative examination through the aortic valve annulus did not disclose any significant mitral lesion that required ether surgical repair or valve replacement.

13 patients died postoperatively giving an operative mortality of 9.09%. These 3 emergency cases recovered. Before February 1991, the overall operative mortality rate was 3.77% in 53 Bentall's procedure. From then up to March 1994, the overall mortality went up to 7.62%, which reason is that more complicate procedure was done late, and more cases (96 cases) complicated with aortic dissection. 10 cases death(10.40%), and in the group without dissection, the mortality revealed 6.38%, no death in 14 cases treated with Cabrol & Wheat operation. There were 13 late deaths in follow – up period making the long – term survival rate of 90%.

With the advance of medicine and surgical techniques, Bentall composite graft procedure can be performed with lower operative mortality, higher survival rate and better life quality for patients than the others. If the aortic root is 6 cm or greater, operation is strongly indicated even the patient is asymptomatic. Earlier operation prior to the severe damage of the left ventricle will certainly reduce the postoperative mortality and morbidity. Beta blockers, such as antenolol should be used as a adjunctive therapy as well as in the cases of childhood management for delaying the rate of aortic root dilatation.

The revised New Criteria and the Fibrillin – 1 Gene (FBN1) Expression in the Diagnosis and Assessment of Marfan Aneurysm

Marfan syndrome is an autosomal dominant disorder of connective tissue, which defect gene located on 15q21.1 (kanulanen, 1990). The diagnostic criteria initially established by Beighton et al. in 1988. A revision of criteria for Marfan syndrome and related conditions proposed by De Paepe et al in 1996, and pointed out that molecular analyses

have potential contribution to the accurate diagnosis for Marfan syndrome. Therefore, we used the method of RT－PCR with beta－actin as internal control to semi－quantify a fragment of Fibrillin－1 gene of dermal fibroblasts from 28 patients with Marfan syndrome, 10 with isolate system abnormality, and 19 normal persons as control group.

The results showed that 26 of 28 Marfan patients' FBN1 gene expression levels decrease 70% of that in normal control, the total diagnostic rate arrived to 93%. Significantly positive correlation also demonstrated between FBN1 gene expression and cardiovascular severity grading ($R=04771$, $P=0.005$). The method of FBN1 gene expression can be used for presymptomatic diagnosis of Marfan syndrome and expectant management of equivocal cases. FBN1 gene expression could serve as a prognostic indicator of individuals at risk for developing cardiovascular disorders.

The results in these studies support that FBN1 gene defect is also the main cause of Chinese Marfan syndrome, and that "Dominant Negative Mutation," a pathogenetic mechanism currently proposed for Marfan syndrome. This method is useful to manage early and promptly to those who diagnosed as Marfan syndrome.

Experimental & Clinical Studies for Prolongation of Deep Hypothermic Circulatory Arrest Safe Time

Marfan's aneurysm some time involved the aortic arch totally or partially, especially in the cases, who complicated with aortic dissection. We have been using retrograde cerebral perfusion through superior vena cava & have gotten 120 min safe time experimentally, 13 clinical cases with longest 81 min. No any cerebral injury was found. No death postoperatively. The results both in experimental study and clinical operation have been proved that it is very useful & helpful for the operation on aortic arch.

Prevention of Spinal Cord Dysfunction and Collapse Lung Massive Haemorrhage During Left Atrial to Femoral Artery Bypass after Descending Thoracic Aneurysm Operation

In spite of recently improved surgical techniques to manage the lesion of the descending thoracic aorta, injury of the spinal cord function is still a severe postoperative complication. We prefer to use left atrial to femoral artery bypass for this kind of operation. We have been perfomed experimental research and have found some personally experience for prevention these complications effectively that should be keeping the amounts of left atrial drainage over 35 ± 3.1ml/kg/min, and the left atrial pressure $0.62 \sim 2.0$kPa and perfusion pressure over than 7.47 ± 0.53kPa. Clinically 14 cases were operated, none of who complicated with spinal cord dysfunction & collapse lung massive haemorrage with a lower mortality (13.15%) & improved postoperative life quality.

The Management of Pregnancy in Marfan Syndrome Patients

The management of pregnancy in normal circumstance is a relatively straightforward procedure with low risk to both the mother and the baby. However, Marfan syndrome is a genetic disorder with major manifestations in the ocular, skeletal, and cardiovascular systems. The cardiovascular complications are the leading cause to death. When a female suffers Marfan syndrome, she is obvious concerns both the problems of her marriage & pregnancy and the possibility of her child also suffering for this disorder. There is no any clinical experience in this respect summarized in China so far.

In this study, the clinical profiles of 17 female Marfan syndrome patients in our hospital from 1987 to 1996 were reviewed in detail. Their diameters of aortic root were measured with UCG, and the diagnosis of aortic dissection confirmed with UCG, MRI and operation. Student－t test to obtain the P value was used in both groups with and without dissection. Correlation was perfomed among the event of aortic dissection, the diameter of aortic root, marriage, pregnancy and gestation. Differences were considered significant if P values were <0.05.

7 of 17 patients had the familial history of Marfan syndrome, and 3 had one or more children affected. The mean diameter of aortic root in the group with dissection was greater than that in the group without dissection ($P=0.022$). The marriage & pregnant patients in former group were more than that in latter group($P=0.007$) and that aortic dissection appeared during gestation was found in one woman. The event of aortic dissection was significantly correlated with the diameter of aortic root ($R=0.7354$, $P=0.001$).

The results in this study indicated that marriage, pregnancy and gestation play a positive role in the event of aortic dissection. The Marfan patients should not permit to be pregnant until the prenatal molecular diagnostic tests have been established. If the aortic root at its widest point is greater than 4 cm, pregnancy in not advised; If greater than 4.5 cm, the child should be considered to perfomed elective cesarean. Before cesarean, Warfarin should be stopped

for 2 days and use heparin as a substitute to reduce hemorrhage.

As above all, I believe that With the molecular genetics, the nature essence of Marfan syndrome being understaned deeper and deeper, day by day and year by year, the problems of systemic management & prevention of this syndrome should be resolved through molecular diagnosis and gene therapy.

G006

CURRENT STATUS OF SURGICAL MANAGEMENT FOR ESOPHAGEAL CANCER

Zhang Rugang

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China Union University of Medical Sciences

1. Introduction

Esophageal cancer is a global health problem . The incidence and mortality of the disease have still been high in China. A recent randomized vitamin supplement trial lowered the incidence of esophageal cancer in Chinese high incidence area of the disease. Recently, surgical resection remains the mainstay of treatment for esophageal cancer. Combined therapy, particularly involving preoperative therapy, is under intense study. According to the collective data of different series, the resectibility ranged from 58% to 92%, surgical morbidity was from 6.3 % to 20.5% and 30 - day mortality ranged from 2.3% to 5%. The 5 - and 10 - year survival rates varied from 8% to 30% and 5.2% to 24%, respectively. Between 1958 and 1995, 4538 patients with esophageal cancer were surgically treated in Cancer Hospital of Chinese Academy of Medical Sciences. The overall resectablity, mobidity and 30 - day mortality rates were 87.7%, 27,6% and 3.5%, respectively. The actual 5 -, 10 -, 15 - year survival rates were 29.9%, 23.4% and 17.6%, respectively. As far as the same series of 287 patients in the year of 1995 is concerned, the resectibility rate and 30 - day mortality were 95.5% and 2.1%, respectively. The preliminary surgical result is related to surgical expertise.

2. Preoperative staging

Preoperative staging of esophageal cancer is very improtant to assess whether the primary curative resection can be planned. The staging studies generally require some combination of computed tomograpy (CT) scan, magnetic resonance imaging (MRI), endoesophageal ultrasound (EUS), thoracoscopy and other tools. CT has been used for evaluation of local invasion of adjacent organs, nodal status and distant metastases. The value of MRI in staging has yet to be difined. EUS is classified as a highly useful tool in detecting depth of tumor invasion and reginal lymph node involvement. It is reliable in detecting the correct T - stage (mean 82.92%) over the correct N - stage (mean 77.6%) but not widely available because of the high cost for the instrument and experience needed. In fact this is a basic dianostic technique to predict surgical curability. To date, positron emission tomography (PET)is using in preoperative staging. 18 - Fluorodeoxyglucose(FDG) - (PET) images glucose metabolism of cancerous lesions of lymph nodes or recurrent sites. FDG accumulates in tumor tissue which is called chemical trapping. The radioactivities of FDG administeed i. v. are measured in plasma(Cp)and tumor(Ci). It was supposed that Ci/Cp(60) reflected the hexokinase actvity. A significant correlation between hexokinase activity and Ci/Cp(60)was noted. Metastatic lymph nodes were displayed as hot image. The metastatic lesions could be diagnosed using Ci/Cp(60) $>$ 2.0 as a criterion. Thus the metastatic lymph nodes were able to be diagnosed by FDG - PET. A barium swallow reveals the tumor as being supracrinal or infracrinal and evaluates the degree of stenosis as well as the anatomical relation of the tumor to the adjacent oragans. Thoracoscopy allows evaluation of entire thoracic esophagus and peri - esophageal nodes in the right chest and the aortopulmonary window nodes, periesophageal nodes and mid - to lower thoracic esophagus in left chest. Occult pleural and pumonary metastises can be readily identified at thoracoscopy. Neck ultrasound, laparoscopic ultrasound and laparoscopy may have a potential as future staging procedures.

3. Surgical therapy

Surgical resection should be defined as the standard approach for the resectable stages of esophageal carcinoma outside of clinical trials of multimodality treatment. There are different technical points in resection of esophageal

cancer. They vary in one or more of the following: operative approach, extent of resection, lymph node dissection, conduit reconstruction, and type of anastomosis. Comparison of different series is difficult because results are not presented in a standardized format. The concepts of "resectable" or "survival rate" also differ from the series to series. Here is surmmarizing the most comparable data from published series. However, most Chinese surgeons prefer a left posterolateral thoracotomy for esophageal cancer located below the aortic arch or at the gastric cardia. Right posterolateral approach is restricted to cancers at or above the level of the aortic arch. Esophagectomy or esophagogastrectomy with two－field lymphadenectomy is indicated as a standard resection. At present, it is possible to determine the precise staging preoparatively. Therefore, different types of procedures are carried out surgically for esophaeal cancer. Endoscopic mucosal resection (EMR) is indicated for intraepithelial cancer and blunt dissection is adopted for the cancer invasion up to the level of musculalis mucosa(m.m.). When cancer is located in mucosal layer with positive lymph node meatstasis, or in submucosal layer (s.m.) wihtout lymph node netastasis, two－field lymph node dissection is indicated after radical esophagectomy. As soon as lymph node is involved, the cancer is to be considered as systemic without chance of a cure. Based on this opinion Orringer reported the results of transhital esophagectomy (THE) wihtout lymphadenectomy. The 5－year survival was 26% in Orringer's series of 636 patients. It was almost the same survival as with more extensive resections. On the other hand, there is another belief that cure can be obtained in patients with lymph node metastases by an aggressive surgical approach. Skinner reported an overall 5－year survival rate of 22% after en bloc esophagectomy, a survival which was much better than the historical controls. It was claimed that this favourable result was due to the technique of en bloc resection. Recently an agreement on the different extents of lymphatic dissection has been reached it, standard lymphadenectomy, extend mediastinal lymphadenectomy and total mediastional lymphadenestomy. However, Akiyama advocated curative resection with three－field (cervical, mediastinal and abdominal) lymph node dissection for patients with squamous cell carcinoma extending beyond the mucosal layer. There was an overall 53.3% 5－year survival after three－field dissection vs 37.5% after two－field dissection. Nabeya obatined a 48% vs 34% for N0 and 34% vs 22% for N1 again comparing threevs two－field lymphadenectomy, respectively. Three－field lymph node dissection obviously carried an increase in operative mobidity, especially for recurrent nerve palsy and respiratory complications. However, the operative mortality was not significantly increased in either two－ or three－field lymphadenectomy in well－experienced hospitals, being bellow 5% in some Japenese series. Curative resection is defined as an R0 resection. It means absence of residual tumor after excision in any of the margins (proximal, distal and lateral margins) of the surgical specimens. Roder showed a statistical diference between R0 and R1 or R2 resections for esophageal squamous cell carcinoma with a 5－year survival of 35% and below 10% respectively. On our series there was a 36.4% 5－year survival for R0 vs 11.8% for R1 and R2 resections. Chen from Zhengjiang medical college affiliciated hospital and She from Fujian cancer hospital performed three－field lymphadnectomy in selected patients with esophageal cancer in China but so far the long term results have not been reported. The question is whether more radical dissection really improves long term survival. Japanese colleagues have been paying more attention to the results of extensive lymphadenectomy comparing the value of two－vs three－field lymph node dissection, and mostly reporting an advantage in favor of three－field dissection with esophagectomy. It is generally supposed that cancers at or above the tracheal bifucaiton should be the best candidate for three－field esophagectomy. It is also indicated for the patients with lymph node metatases. The benefits might be more evident for stage Ⅰ to ⅡB patients with esophageal cancer. The key problem is that there have been no strict clinical trials from multimedical centers under a united protocal with a large number of patients. The thoracoscopy and vidio－asisted thoracic surgery (VATS) have been emerged in staging and esophageal procedures. The possibility of performing esophagectomy and lymphadenectomy under visual control appeared to be theoretically advantageous. Gossot reported the technique and initial results of thoracocopic esophagectomy with a series of 15 patients. There were three cases converted into a thoracotomy. The average time of the thorcoscopic stage was 125 minutes and average blood loss was 200ml. Two patients had a left atelectesis. Huo from Hong Kong has operated on fifty－two patients with thoracic esophageal cancer under VATS. There were no severe postoperative complications and operative deaths. According to the reported series, operative mortality after thoracoscopic esophagectomy is comparable to open surgery and it does not seem to have any direct relation to the minimally invasive approach. Pre-

liminary reports on long－term results are related to the neoplastic staging and not to the surgical access. However, enlarged dissections are time－consuming and need a long single－lung ventilation. Sophisticated skill and perfect instrument are much nore needed for the surgical team. Since there are no clinical standard indications to this procedure, VATS on the esophageal surgery will continue to be an area of experimentation. It needs to be indicated further. As regards the patients with locally advanced cancers beyond the curability criteria, palliative resective surgery is indicated in low risk patients. The point is that the patients should be entered into prospective trial of combined therapy in order to raise the resectibility and improve therapeutic results.

4. Future direction

The surgical results for esophageal cancer are dismal because majority of patients present with locally advanced (T3－T4 or N+) disease. In general, patients with Tin situ or T1－T2N0 tumors may more appropriately receive surgical treatment as the gold standard. The optimal treatment for both patients with a resectable, potentially curable esophageal cancer, or a locally advanced tumors is unknown as yet. Preopertive neoadjuvant therapy has been used in potentially resectable tumors to improve the long－term survival and in locally advanced esophageal tumors, also to increase the resection rate and improve the duration of pilliation. Preoperative rediotherapy may shrink the primary tumor to improve resectibility and survival, especially in proliferative type cancers, but the clinical trials have failed to reveal in survival benefit. According to clinical data of preoperative chemotherapy, a survival advantage could be demostrated mostly in patients manafesting a complete response but overall survival was not improved. Preoperative chemoradiotherapy seems to improve the resection rate and local tumor control but it is associated with postoperative morbidity and mortality. A benificial effect appears to be limited mostely to the responders of chemoradiotherapy. Postoperative adjuvant therapy is given to eradicate possible subclinical disease in R0 resections. Additive therapy can be defined as a postoperative treatment to control micooscopic disease in R1 and gross disease in R2 resections. The optiomal regimens of postoperative multimodality combinations of chemotherapeutic agents or radiation methods need to be found. The clinical trials are getting under way.

G007

SURGICAL TREATMENT OF CONGENITAL HEART DISSASE

Wang Zengwei

G008

THE SURGICAL TREATMENT OF LUNG CANCER－A RETROSPECTIVE ANALYSIS OF 2,004 CASES

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A total of 2004 lung cancer patients were admitted to authors' department over a span of 33 years (1961－1993). There were 1571 males and 433 females. Their age ranged from 20－80 years with a mean of 53.9 years. The pathological classification was: squamous cell carcinoma 944 cases (27.1%), adenocarcinoma 694 cases (34.6%), small cell carcinoma 167 cases (8.3%), adeno－squamous cell carcinoma 78 cases (3.9%), large cell carcinoma 22 cases (3.1%), alveolar cell carcinoma 17 cases (0.8%) and miscellaneous 82 cases (4.1%). Among 1721 resected cases the p－TNM staging revealed stage Ⅰ 860 cases (50%), stage Ⅱ 407 cases (23.6%), stage Ⅲ 431 cases (25%), stage Ⅳ 21 cases (1.2%). The overall resectability was 85.9%, morbidity was 15.7%, 30－day mortality was 1.3%. Among complications pulmonary complications ranked first, occurring in 57 cases (22.5%). Those carried high fatality were respiratory failure, cardiac arrythmia, internal bleeding and pulmonary embolism. Comparing modes of resection with collective data in China authors' series was characterized by less pneumonectom cases (16.3% v.s. 20.0%) and more bronchoplastic lobectomy (9% vs 4.6%).

Acturial 5－yr survival was 38.8%. Possible influencing factors on longterm survival were nature of resection,

mode of resection, presence or absence of lymph node metastasis, degree of tumor extension, pathological types and p - TNM staging.

Authors consider stage Ⅰ, Ⅱ and Ⅲ a non - small cell lung cancer and stage Ⅰ and Ⅱ SCLC as surgical indications. Accurate preoperative staging was emphasized. Sleeve lobectomy should be performed to replace pneumonectomy whenever situation permitted.

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