Forum Abstracts – Congenital Forum

Sunday, June 23, 2002, 9:00 a.m. – 10:00 a.m.

45 VIDEO-ASSISTED THORACOSCOPIC VASCULAR RING DIVISION IN INFANTS AND CHILDREN

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OBJECTIVE: Vascular ring division has traditionally been performed through a muscle-splitting posterolateral thoracotomy. Recent case reports have documented the feasibility of vascular ring division using video-assisted thoracoscopic surgery (VATS). We report the largest experience to-date in vascular ring division using minimally-invasive VATS techniques.
METHODS: 38 consecutive patients who underwent VATS vascular ring division at Boston Children's Hospital between 1/1991 and 1/2002 were retrospectively analyzed.
RESULTS: There were 22 males (58%). Average weight was 14.2 ± 10.9 kg (range: 2.7 – 56.8 kg); average age was 3.0 ± 3.0 years (range: 4 days – 12.0 years). Airway symptoms predominated (44% presented with airway symptoms only, 34% with both airway and esophageal symptoms, and 16% with esophageal symptoms only). A patent vascular ring was present in 19%. 69% had a right aortic arch with an aberrant left subclavian artery and a left ligamentum, while 31% had a double aortic arch with an atretic left arch and a left ligamentum. One patient had situs inversus. 84% had one structure divided, while the rest had two structures divided. Four patients were converted to thoracotomy (1 for intercostal vein bleeding, 1 for adventitial vessel bleeding, 1 for a large patent vascular ring, and 1 for a very short atretic double aortic arch). 27% left the operating room with a chest tube (only 2 of the last 29 patients, both of whom had conversions to thoracotomy). 90% were extubated in the operating room. There were no perioperative deaths. One patient developed chylothorax and underwent thoracoscopic ligation of a leaking lymphatic vessel. Two patients had unilateral vocal cord paralysis. Another patient had late thoracoscopic aortopexy for tracheal compression. Various procedure-related times are shown in Table I.

	Mean ± standard deviation	Median
Overall length-of-stay	2.4 ± 2.9 day	1 day
Postoperative length-of-stay	1.5 ± 0.8 day	1 day
Chest tube duration	0.3 ± 0.7 day	0 day
Duration of operating room stay	2.98 ± 0.53 hours	2.91 hours
Duration of surgical procedure	1.75 ± 0.43 hours	1.69 hours

CONCLUSIONS: Minimally-invasive thoracoscopic vascular ring division is feasible in the pediatric population, with acceptable postoperative morbidity and short operative times and postoperative stay. We currently recommend this procedure for vascular rings with little or no patency in the structures to be divided.

46 CLOSURE OF PATENT DUCTUS ARTERIOSUS BY VIDEO-ASSISTED THORACOSCOPIC SURGERY; MINIMALLY INVASIVE, MAXIMALLY EFFECTIVE: 420 CASES

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OBJECTIVE: In the last decade, increasing interest has focused on diferent applications and various aspect s of minimally invasive surgery . To further determine the safty and efficasy of video-assisted thoracoscopic surgical (VATS) closure of Patent Ductus Arteriousus (PDA) , we prospectively studied 420 patients treated by this new method.
METHODS: From June 1997 to January 2002, 420 consecutive patients diagnosed as PDA (mean age: 6 years old), were referred to us, all of them met our inclusion criteria eligible for VATS procedure. Recently, we have made some minor alterations in our routine methodology, which will be discussed in more detail later. After complete closure of PDA by two titanium clips, the extubated patient leaves the Operating Room (O.R.) without a chest tube.
RESULTS: All the pertainig data were collected and analyzed. There were two cases of chylothorax, which were succesfully treated by thoracotomy and ligation of the small lymphatic ducts, after one week of close observation. The procedure was changed to thoracotomy in four adult patients due to inappropriately dilated canal (grater than 9 mm), meanwhile, three additional patients developed transient recurrent laryngeal nerve dysfunction. All cases were re-assessed immediately after the procedure, and followed for near 5 years by control echocardiography. No significant complication and residual shunt was recorded during the follow-up period. Mean procedure time was about 20+/-2 minutes. All patients were discharged shortly after the procedure (~20 hours).
CONCLUSIONS: This experience indicate that video-assisted thoraciscopic surgery is superior to other techniches of ductal closure, as well as, it is simple , rapide, cost-effective, and more comfortable for the patients, in addition to the cosmetic benefits.

47 ROBOTIC ASSISTED ENDOSCOPIC THORACIC AORTIC ANASTOMOSIS IN JUVENILE LAMBS

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OBJECTIVE: Advances in robotic technology have enabled minimally invasive approaches in surgery for acquired heart disease. With increased technical sophistication, robotic-assisted techniques can be developed for the endoscopic repair of certain congenital cardiac lesions. The purpose of this study was to assess the feasibility of closed chest repair of congenital aortic obstruction in a juvenile ovine model.
METHODS: Lambs, aged 45-55 days, underwent surgery using the da Vinci robotic surgical system. Using three ports, the descending thoracic aorta was dissected and mobilized free from attachments using single lung ventilation and CO2 insufflation. Snares were introduced through two stab wounds for aortic occlusion proximally and distally. In four lambs, the aorta was completely transected and re-anastomosed endoscopically. One lamb underwent longitudinal aortotomy and patch aortoplasty with placement of a Gore-Tex patch. Snares were released and the animals were recovered once hemodynamically stable. Animals were sacrificed at four to twelve hours after surgery and the descending aorta was harvested. Burst pressure testing was performed on the anastomoses.
RESULTS: All five lambs survived the procedure with stabilization of hemodynamic parameters following surgery. The mean aortic clamp time was 47±17 minutes and the anastomosis was completed in 26±5 minutes. The mean burst pressure was 163±9 mm Hg.
CONCLUSIONS: Endoscopic thoracic aortic anastomosis can be performed safely and with adequate exposure in a juvenile large animal model using computer-assisted surgical techniques. With further refinements, these approaches could be applied to the repair of congenital anomalies of the aorta, including interrupted aortic arch and aortic coarctation.