

Department of Surgery

Division of Pediatric Surgery and Vascular Surgery

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General Summary

Pediatric Surgery

Surgery for children at The Jikei University Hospital is offered by a highly trained, expert team of pediatric surgical professionals who specialize in the diseases and conditions affecting young people. Our surgeons work exclusively with infants, children and adolescents and understand their unique needs.

Vascular Surgery

Research projects of our department have focused on the development of the endovascular repair of aortic aneurysms, treatment of peripheral arterial disease with new techniques and devices including clinical trials.

Research Activities

Pediatric Surgery

1. Education

Education for medical students: The patients with pediatric surgery have congenital anomaly. The lecture of pediatric surgery for students is based on embryology.

Education for training doctors: Three objects for training doctor in pediatric surgery are: 1) How to obtain a blood sample from pediatric patients, 2) Understanding about fluid therapy for pediatric patients, 3) Learning the way of buried suture.

Education for surgical residents: They are able to operate as operator or assistant for pediatric surgery.

2. Clinical study

Minimally invasive and scarless surgeries. That's how we make our mark.

1) Endoscopic treatment for vesicoureteral reflux using Deflux®

There are three options for managing or treating vesicoureteral reflux. We select the endoscopic treatment with Deflux. We have treated three cases, two cases were treated completely.

2) Laparoscopic percutaneous extraperitoneal closure for inguinal hernia: learning curve for attending surgeons and residents

Laparoscopic percutaneous extraperitoneal closure (LPEC) for pediatric inguinal hernia is a simple technique in which a purse-string suture made of nonabsorbable material is placed extraperitoneally around the hernia orifice by a special suture needle (Lapaherclosure™). Concerns have been raised about the extensive learning curve for both attending

surgeons and residents to master this technique. This study assesses the difference in learning curves for the safe performance of LPEC by attending surgeons and residents.

3) The Nuss procedure also aims to force the sternum forward and hold it there with an implanted steel bar, but without making a big incision to resect the abnormal cartilage. In this procedure, the curved steel bar is placed under the sternum through two small incisions on the sides of the chest. No. 3 in Japan; The number of surgical patients with pectus excavatum is the best three in Japan.

3. Basic study

1) MicroRNAs transported by exosomes in body fluids as mediators of intercellular communication in human neuroblastoma. Cancer-cell communication is an important and complex process, achieved through a diversity of mechanisms that allows tumor cells to mold and influence their environment. In recent years, evidence has accumulated indicating that cells communicate via the release and delivery of microRNAs (miRNAs) packed into tumor-released (TR) exosomes. Understanding the role and mode of action of miRNAs from TR exosomes is of paramount importance in the field of cancer biomarker discovery and for the development of new biomedical applications for cancer therapeutics.

Vascular Surgery

1. Development of endovascular repair of thoracoabdominal aneurysms

Although stent grafts for the treatment of abdominal aortic aneurysms (AAAs) have been developed and are commercially available, no such stent grafts are available for the treatment of thoracoabdominal aortic aneurysms (TAAAs) in Japan. The surgical death rate following open surgery for the treatment of AAAs is satisfactory, but that for the treatment of TAAAs remains unacceptably high at 15% to 20%, and further improvement is desperately needed. Because a TAAA involves 1 or more visceral arteries, visceral perfusion must be maintained while the aneurysm is excluded with stent grafts. We have used a custom-made t-Branch stent graft in combination with covered stents (for visceral reconstruction) for the treatment of TAAAs that were considered inoperable because of comorbid conditions or a hostile thorax/abdomen after an approval of IRB. Although stent graft repair for TAAAs requires long operative and fluoroscopic time, this treatment is feasible and safe.

2. Development of endovascular repair of aortic arch aneurysms: Retrograde in-situ branched surgery; Branched Thoracic Arch stent grafts

We have developed a new minimally invasive operation for aortic arch aneurysms. After carotid-carotid bypass surgery if needed is performed and stent grafts are placed, a needle is used to prick the stent graft thorough one side of a carotid artery, after which a covered stent is inserted as a branch and deployed into the stent graft (in an in-situ retrograde fashion). We have examined this retrograde in-situ branched surgery in an in-vitro study and have applied it clinically. This operation is expected to be a less invasive surgery for aortic arch aneurysms. We also use Branched Thoracic Arch stent grafts those are commercially available in Europe for endovascular repair of aortic arch aneurysms after an approval of IRB.

3. Research on drug-eluting stent in the superficial femoral artery

The Zilver PTX drug-eluting peripheral stent (Cook Medical, Bloomington, IN, USA) is

specifically designed and approved to treat peripheral arterial disease affecting the superficial femoral artery, the main vessel of the thigh. The Zilver PTX is a self-expanding stent made of nitinol, a space-age “shape memory” metal that offers unique mechanical advantages for a stent in the superficial femoral artery.

Both a global registry and a randomized controlled trial, in which most patients were enrolled in the United States, but also in Germany and Japan. We participated in this trial. After reviewing its 1-year primary endpoint, the Zilver PTX received approval from the Japanese Pharmaceuticals and Medical Devices Agency in January 2012 and is now commercially available in Japan.

Publications

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