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‘Back-door’ angioplasty clears tough artery blockages

EDMONTON — Heart patients with stubborn artery blockages that cannot be cleared by traditional angioplasty can now avoid bypass surgery thanks to a technique first brought to Western Canada by the CK Hui Heart Centre at the Royal Alexandra Hospital.

With the support of the Royal Alexandra Hospital Foundation, the Chronic Total Occlusion (CTO) program employs a leading-edge procedure to clear heart arteries via ‘back-door’ (or retrograde) angioplasty.

“It’s a whole different option of how we can open up these arteries,” says Dr. Raymond Leung, interventional cardiologist at the CK Hui. “As well, like tunnel builders, if need be, we can insert two catheters, one in each wrist, to meet in the middle, to work at the blockage from both sides.”

During a conventional angioplasty procedure, a thin wire is inserted into the groin (femoral artery) or wrist (radial artery) and threaded through the circulatory system to the blockage near the heart, where a balloon may be inflated to clear the vessel. Afterwards, a stent — a tiny wire mesh tube — can be inserted and left at the site to keep the artery open, improving blood flow.

Unlike conventional angioplasty, the retrograde CTO method threads a wire along a different route, often through tinier blood vessels, which lets doctors approach the back side of the arterial obstruction — opposite to the side facing blood flow, which can develop a hard “cap” from the blood pressure — to get rid of the obstruction from its softer side.

The CK Hui Heart Centre has gained a global reputation for its growing expertise and refinements to this procedure. Patients go home within hours as opposed to having major surgery, such as a heart bypass, which requires a minimum five-day hospital stay.

“A lot of patients who would otherwise have to go for open-heart surgery to have their blood flow restored can now be helped with just a catheter through an artery,” says interventional cardiologist Dr. William Hui. “With open-heart surgery, they’re in hospital at least five to seven days, and left with a sternal wound that may take months to recover from.”

Glen Nichols, an oilsands construction co-ordinator, underwent a two-wrist CTO procedure following a heart attack.

“What impressed me was the high level of professionalism and communication while I was awake on the table,” says the 46-year-old from Fort McMurray, who had one artery cleared by traditional angioplasty and was referred to the CK Hui for another artery that was obstructed. “Everybody knew what they were doing in that room. There was no second-guessing. They made that difficult procedure seem so effortless.”

“With Glen,” says Dr. Leung, “we needed to do two approaches, one through the front door and one through the back door, in order to meet up in the middle, to balloon up and open his artery.”

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Celebrating its fifth anniversary, the CTO program continues to increase access to this procedure. In a typical year, 2,000 angioplasties are performed at the CK Hui. Of these, about 15 per cent (300 procedures) involve totally obstructed arteries. While most of these obstructions can still be cleared by 'front-door' (or anterograde) angioplasty using finer wires and the CK Hui's advanced techniques — the number of patients who require the rare 'back-door' angioplasty at the CK Hui has grown to 80 patients this past year from 20 patients in its first year.

"There are also patients who have already had open-heart surgery," says Dr. Hui, "where sometimes, after several years, the bypass becomes blocked. They may not have the option of a repeat open-heart surgery. Our CTO technique can sometimes help these people, too."

At a time when more than 95 per cent of the world uses a groin insertion for angioplasty, the CK Hui's refined expertise in the wrist approach also brings substantial benefits to the patient.

"With the wrist approach, the patient is more comfortable during the procedure. Afterwards, the patient can sit up and start walking within half an hour," says Dr. Leung. "With the approach from the groin, with the femoral artery, they need to stay in bed for six hours or more after."

In September, the program's lead interventional cardiologist, Dr. Leung, visited Hong Kong, by invitation, to lecture and demonstrate his angioplasty technique to the Asian medical community. As well, he has shared the CK Hui's knowledge, training and technical expertise with hospitals in Calgary and Vancouver, where new CTO programs are taking shape.

The CK Hui program has also caught the eye of the world-renowned Japanese interventional cardiologist Dr. Masahiko Ochiai of Tokyo — one of the pioneers of the method dating back to 2007 — who has twice visited the CK Hui in the past year to mentor and observe the three doctors here who perform and have refined his procedure: Dr. Leung, Dr. Hui and Dr. Neil Brass.

Andrew Otway, President and CEO of the Royal Alexandra Hospital Foundation, says: "This program is just one of many examples of how the CK Hui Heart Centre is really advancing the science of cardiology. We're thrilled that our ongoing support of the CK Hui Heart Centre has resulted in so many innovative treatments, cutting-edge technology and excellent patient care."

Proceeds from this year's Healing Heart Affair fundraiser went towards the CTO program.

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The Royal Alexandra Hospital Foundation, as a respected fundraising leader, inspires community support for the Royal Alexandra Hospital and its Centres of Excellence including the Lois Hole Hospital for Women, the CK Hui Heart Centre, the Regional Eye Centre and the Orthopedic Surgery Centre. The Foundation empowers compassionate and innovative patient care through leading-edge education, research, technology and facility enhancements.

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