

2019 and 2020 calendar years. A survey was sent to each site detailing questions on clinic and procedural volumes and wait times pre and post pandemic restrictions. Descriptive statistics were used with student t test to compare groups. Pre-pandemic (2019) there were 19326 ACHD clinic visits across Canada with 296 (1.5%) being virtual. During the first year of the pandemic (2020) there were a similar number of total clinic visits 20532, however 11412 (56%) visits were virtual $p < 0.0001$. Total procedural volumes for ACHD care are presented in figure 1. Pre-pandemic mean estimated clinic waiting times (in months) for non-urgent consults were: 5.4 + 2.57 vs. pandemic wait time 6.5 + 4.22, $p=0.65$, for elective ACHD cardiac surgery 6.0 + 3.46 vs. 7.3 + 4.59, $p=0.47$, for ACHD electrophysiology procedures 6.3 + 3.33 vs 6.7 + 3.27 $p=0.72$, for ACHD percutaneous intervention 4.6 + 3.89 vs 4.4 + 2.33 $p=0.74$.

CONCLUSION: During the pandemic, despite social distancing restrictions, the use of virtual clinics visits have helped to maintain continuity in ACHD clinical care. The procedural volumes and wait times for consultation, percutaneous and surgical interventions were not delayed.

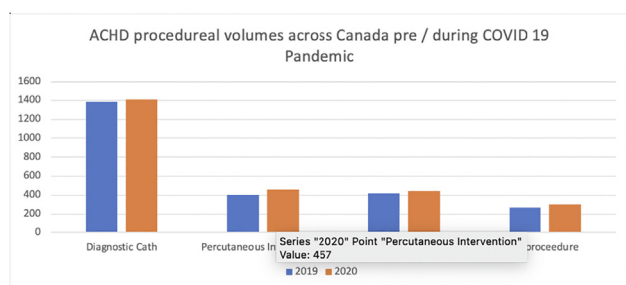


Figure 1: Absolute numbers across Canada for specialized ACHD diagnostic cardiac catheterization, ACHD percutaneous intervention, ACHD surgery and procedures, prior to (2019) and during (2020) the COVID-19 pandemic. No statistical difference between groups. ACHD = Adult congenital heart disease, Cath = catheterization, EP = electrophysiology

based on anatomical complexity scores, a global comprehensive approach could help guiding the clinical decision and allow predicting CTO-PCI success. In this study, we aimed to evaluate angiographic predictors of procedural success.

METHODS AND RESULTS: This single-centre prospective observational study was conducted in an academic tertiary care medical center and patients were recruited between January 2014 and March 2020. CTO was defined as 99-100% occlusions with Thrombolysis in Myocardial Infarction (TIMI) 0 flow with at least 3-month duration. The primary inclusion criteria were the presence of refractory ischemic symptoms despite optimal medical therapy and non-invasive imaging demonstrating reversible ischemia. A total of 255 patients were consecutively enrolled in this registry. Average age was 65 ± 10 and 75% were males. Hypertension and diabetes were present in 73% and 27% of patients respectively. The left ventricular ejection fraction (LVEF) was above 50% in 73% of patients. The mean SYNTAX and J-CTO scores were 19.3 ± 8.6 and 2.26 ± 1.11 respectively. The overall CTO-PCI success rate was 86.4%. Univariate analysis showed that a high J-CTO score >1 predicted decreased CTO PCI success in 83.5% vs 94.1%, $p=0.038$. In addition, patients with procedural success had a lower percentage of history with bypass graft (73.8% vs. 88.8%, $p = 0.004$), significant left main stenosis (61.9% vs. 88.9%; $p=0.003$), reference vessel diameter $< 3\text{mm}$ (82.7% vs. 96.9%, $P=0.003$). Finally, a lower median Syntax score was a predictor of procedural success (17 IQR 12-24 vs. 20.5 IQR 15-29.5, $p=0.036$).

CONCLUSION: Beyond the J-CTO score, several angiographic parameters related to the CTO lesion complexity and the coronary atherosclerotic burden predict the risk of CTO PCI failure. This hypothesis-generating analysis needs to be validated in future large-scale studies as it could improve patient selection and refine decision making for such a complex coronary intervention.

Canadian Cardiovascular Society (CCS) Abstracts — CSI

P053 ANGIOGRAPHIC PREDICTORS OF CTO PCI SUCCESS: HOW TO GUIDE DECISION MAKING BEYOND THE J-CTO SCORE

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BACKGROUND: Chronic total occlusion (CTO) recanalization remains one of the most challenging procedures in interventional cardiology, and the inability to cross the lesion with a guidewire is the most common cause of CTO percutaneous coronary intervention (PCI) failure. While the current standard lesion evaluation is mostly

P054 LINKS BETWEEN CORONARY MICROVASCULAR DYSFUNCTION AND EVIDENCE OF HEART FAILURE WITH PRESERVED EJECTIVE FRACTION

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BACKGROUND: It has been hypothesized that coronary microvascular dysfunction (CMD) may be associated with the development of myocardial abnormalities associated with heart failure with preserved ejective fraction (HFpEF). Making a diagnosis of HFpEF is aided by exercise right heart catheterization (RHC) based on an abnormal pulmonary artery wedge pressure (PAWP) response during exercise. An

exercise-associated increase in PAWP adjusted for the change in cardiac output ($\Delta\text{PAWP}/\Delta\text{CO}$) greater than 2 mmHg/L/min is a clinical predictor for HF outcomes and predicts exercise capacity. Although there is speculation that CMD may play a role in the development of early HFpEF, there is limited evidence that directly links CMD as assessed by an invasive coronary physiology study (ICPS) with HFpEF as measured by an exercise RHC.

METHODS AND RESULTS: This study was an exploratory, retrospective cohort analysis. The study population included patients experiencing unexplained cardiovascular symptoms including chest pain and dyspnea who were referred to our institution for a RHC with exercise who had also undergone an ICPS. Patients were classified hemodynamically based on a $\Delta\text{PAWP}/\Delta\text{CO} \leq$ or > 2 with exercise. Coronary physiology interventions included Doppler flow assessment after administration of intracoronary adenosine and acetylcholine, where coronary flow reserve (CFR) and the index of microvascular resistance (IMR) were quantified during hyperemia. To date, we identified a cohort of 20 patients who met the study's inclusion criteria. Of these, 19 completed a RHC exercise study from which 9/19 (47%) had a $\Delta\text{PAWP}/\Delta\text{CO} > 2$. Characteristics of the patients are shown in Table 1. The mean index of microvascular resistance (IMR) for patients with abnormal exercise hemodynamics was 32.6 versus 20.9 ($p=0.08$).

CONCLUSION: Among patients undergoing an ICPS, a relatively high proportion of these patients exhibit a $\Delta\text{PAWP}/\Delta\text{CO} > 2$ mmHg/L/min. We have also observed that in patients with an abnormal PAWP response, the mean IMR values were higher compared with patients with a normal PAWP response. Our observations support the indication that CMD may play a role in the development of early HFpEF. This relationship needs to be further characterized in a larger cohort.

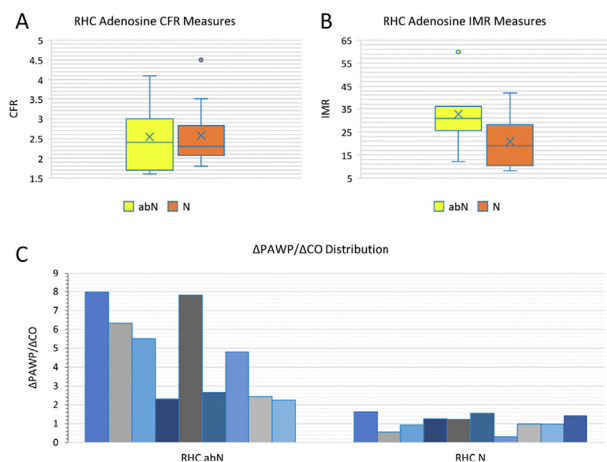


Figure 1. A) The coronary flow reserve (CFR) for patients with abnormal exercise hemodynamics was 2.54 versus 2.58 ($p=0.98$). B) The index of microvascular resistance (IMR) for patients with abnormal exercise hemodynamics was 32.6 versus 20.9 ($p=0.08$). C) 19 patients completed an exRHC study from which 9/19 (47%) had a $\Delta\text{PAWP}/\Delta\text{CO} > 2$.

P055

ONE-YEAR OUTCOMES IN PATIENTS WHO UNDERWENT CORONARY INTRAVASCULAR SHOCKWAVE LITHOTRIPSY FOR HIGHLY-CALCIFIED CORONARY LESIONS

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BACKGROUND: Intravascular lithotripsy (IVL) has been shown to have excellent angiographic and short-term clinical results in patients with heavily calcified lesions who require percutaneous coronary intervention in both randomized and observational studies. However, there is limited data regarding the long-term outcomes in real-world patients. We conducted a follow up of a high-risk IVL cohort at a tertiary care centre to help better define outcomes over a 1-year period post IVL.

METHODS AND RESULTS: We conducted a retrospective cohort study of 50 consecutive patients who underwent IVL between September 1, 2019 and January 31, 2020. One-year outcomes were available for 47/50 patients; 3 patients who did not survive their index hospitalisation (for reasons unrelated to IVL) were excluded. The primary outcome was need for target vessel revascularization (TVR) at 1 year from index procedure. Secondary outcomes included cardiovascular mortality, myocardial infarction (MI), and freedom from angina. The mean age of the cohort was 71.5 years and 38% of patients were female. Fifty-three percent of patients presented with non-ST elevation ACS as the indication for initial IVL. Twenty-six percent of patients underwent IVL for lesions of the left main coronary artery, and 26% underwent IVL for in-stent restenosis (ISR). Of a total of 47 patients (61 lesions), 4% of patients (3% of lesions) required TVR within 1 year; 96% of patients who underwent IVL remained free from repeat intervention on the same vessel. Two (4%) suffered mortality at one year from non-cardiovascular causes. Eighty-five percent of patients remained free from angina at 1 year. One patient suffered an MI within 1 year; the culprit vessel had not previously been treated with IVL.

CONCLUSION: IVL is associated with favorable results out to 1 year with very low rates of TVR. This suggests that IVL is an effective and durable modality for treatment of highly calcified coronary lesions in high-risk patients, including those requiring IVL for the indication of ACS or ISR.

P056

USE OF A DIGITAL APPLICATION TO OPTIMIZE THE CLINICAL TRAJECTORY OF PATIENTS IN A TAVI PROGRAM

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