Informe final

Asistente de investigación

Grupo de Investigación

Cirugía vascular y endovascular (GICIRVE)

Línea de investigación en enfermedad aórtica y enfermedad arterial periférica

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Resumen actividades:

En mis dos años de formación en la especialidad de cirugía vascular periférica me desempeñé cómo líder de residentes en el grupo de Investigación en Cirugía Vascular y Endovascular de la Fundación Cardioinfantil y la Universidad del Rosario. Estoy vinculada a más de 10 proyectos, mis responsabilidades incluyeron coordinación de personal, recolección de datos, análisis y la redacción de los resultados de la publicación.

Adicionalmente, recibí formación en investigación a través de clases virtuales, mi participación abarcó diferentes roles y actividades. Principalmente, mi contribución se centró en la revisión de los temas presentados, algunos de los cuales fueron complementados con presentaciones. Asimismo, participé como asistente en ciertos temas, proporcionando apoyo y contribuyendo al enriquecimiento de las discusiones.

En relación a la metodología empleada, cabe destacar que todas las interacciones y actividades se llevaron a cabo de manera virtual. Este enfoque nos brindó la flexibilidad necesaria para participar activamente en las clases, a pesar de las limitaciones geográficas o de otro tipo que pudiéramos tener.

1. Producto 1

Título: *Emergent hybrid surgical approaches for non-dissecting ruptured Kommerell's aneurysm: a case report series.*

Journal: *Journal of Cardiothoracic Surgery (Q2)*

Autores: *Alejandro Velandia-Sánchez, Sebastián Gómez-Galán, Sebastian Gallo-Bernal, Camilo A. Polania-Sandoval, Ivonne G. Pineda-Rodríguez, Paula Florez-Amaya,* ***Lina M. Sanabria-Arévalo****, Julián Senosiain-González, Juan G. Barrera-Carvajal, Juan P. Umana and Jaime Camacho-Mackenzie.*

Abstract: *Background Kommerell's aneurysm is a saccular or fusiform dilatation found in 3–8% of Kommerell's diverticulum cases. A non-dissecting rupture rate of 6% has been reported. If ruptured, emergent surgical correction is usually granted. However, evidence regarding the optimal surgical approach in this acute setting is scarce. In this case report series, we aim to describe our experience managing type-1 non-dissecting ruptured Kommerell's aneurysm with hybrid emergent surgical approaches.*

Cases presentation From January 2005 to December 2020, three cases of type-1 non-dissecting ruptured Kommerell's aneurysm requiring emergent surgical repair were identified. The mean age was 66.67 ± 7.76 years, and 3/3 were male. The most common symptoms were atypical chest pain, dyspnoea, and headache (2/3). The mean aneurysm's diameter was 63.67 ± 5.69 mm. Frozen Elephant Trunk was the preferred surgical approach (2/3). The Non-Frozen Elephant Trunk patient underwent a hybrid procedure consisting of a supra-aortic debranching and a zone-2 stent-graft deployment. We found a mean clamp time of 140 ± 60.75 min, cardiac arrest time of 51.33 ± 3.06 min, and a hospital stay of 13.67 ± 5.51 days. The most common complications were surgical-site infection and shock (2/3). Only one patient died (1/3).

Conclusion Evidence of management for non-dissecting ruptured Kommerell's aneurysms is scarce. Additional, robust, and more extensive studies are required. The selection of the

appropriate surgical approach is challenging, and each patient should be individualized. Frozen Elephant Trunk was feasible for patients requiring emergent surgical repair in our centre. However, other hybrid or open procedures can be performed.

2. Producto 2

Título: *Surgical Interventions and Follow-up for Marfan Syndrome Aortic Disease: A Latin American Center Experience*

Journal: *Journal of Vascular Surgery (Q1)*

Autores: *Alejandro Velandia-Sánchez, José Vicente Álvarez-Martínez, Camilo Polania-Sandoval, Sebastián Gómez-Galán,* ***Lina M. Sanabria-Arévalo****, Paula Florez-Amaya, Julián Corso-Ramírez, Sebastian Gallo-Bernal, Ivonne Pineda-Rodríguez, Juan P. Umana, Juan G. Barrera-Carvajal and Jaime Camacho-Mackenzie.*

Abstract: *Objective: Marfan syndrome (MFS) is an autosomal dominant disease caused by pathogenetic variants in the FBN1 gene, which encodes fibrillin-1. The underlying progressive dilatation of the aorta and the potential risk of acute aortic syndromes highly influence the prognosis of patients with this syndrome. Surgical correction is frequently needed, requiring multiple reinterventions with high mortality rates. Because of the low prevalence of MFS in Colombia (1.78%), evidence regarding adequate treatment remains scarce. We aim to characterize patients who underwent aortic surgery with a previously confirmed diagnosis of MFS at the Fundación Cardioinfantil-La Cardio from 2004 until 2021.*

Methods: An observational, descriptive case series study was performed. All patients with MFS who underwent an aortic surgical procedure between January 2004 and December 2021 were retrospectively included. Qualitative variables were presented as frequencies and percentages, whereas quantitative variables were presented as mean 6 standard deviation. Kaplan-Meyer plots were used to describe cumulative and reintervention-free survival after the first intervention. Control appointments established out-of-hospital mortality in conjunction with government data and telephone calls.

Results: We identified 50 patients who underwent 56 aortic interventions (Table). The mean age was 38.79 6 14.41 years, 68% were men, and the most frequent comorbidities were aortic

valve regurgitation (66%) and hypertension (50%). Among the aortopathies identified, 70% were aortic aneurysms and 30% were aortic dissection. The predominant aneurysm location was in the aortic root (58%). Surgery was elective in 52%, urgent in 26%, and emergent in 22% of cases. Hemodynamic instability was the main indication for emergent surgery (90.9%). The most frequent surgical procedures were Tirone-David (53.5%), Bentall (14.2%), and thoracoabdominal aortic aneurysm repair (8.92%). A total of 74% of the patients required extracorporeal circulation. The in-hospital 30-day mortality was 4%. The main complications were stroke (10%) and acute kidney injury (6%). The average follow-up time was 108.6 6 69.53 months. The reintervention rates at 1, 2.5, and 5 years were 10%, 14%, and 17%, respectively (Fig 1). The survival rates at 5, 10, and 15 years were 89%, 73%, and 68%, respectively (Fig 2).

Conclusions: In our experience, surveillance programs are essential in the follow-up to maintain high survival rates and identify the need for reintervention. Nonetheless, timely diagnosis remains a concern in Latin America because 48% of patients in this study required urgent or emergent surgery. Further educational strategies must be implemented for health personnel to promptly identify this pathology and increase elective procedures, along with the involvement of the identified patients in follow-up programs.

3. Producto 3

Título: *One-stage or two-stage elective coronary artery bypass graft surgery and abdominal aortic aneurysm open repair in low and moderate cardiac surgical risk patients.*

Journal: *Vascular (Q2) – Aceptado*

Autores: *Julián M. Corso-Ramírez, Alejandro Velandia-Sánchez MD, Paula C. Florez-Amaya, Camilo A. Polanía-Sandoval, Sergio A. Ortigoza-Espitia, Sofía N. Suarez-Vásquez,* ***Lina M. Sanabria-Arévalo,*** *Ivonne Gisel Pineda, Juan G. Barrera-Carvajal, Sebastián Gómez-Galán, Jaime Camacho-Mackenzie.*

Abstract: *Objectives: Coronary artery disease (CAD) and abdominal aortic aneurysm (AAA) are common arterial pathologies that might occur simultaneously; however, there is not enough evidence about the optimal strategy for patients with concomitant indications of coronary artery bypass grafting (CABG) and open repair of the AAA (AAOR). This study aims to present the outcomes in low and moderate cardiac surgical risk patients who underwent one-stage or two-stage elective CABG and AAOR in a middle-income country.*

Methods: An observational, retrospective case series study was conducted. Patients who had low and moderate cardiac surgical risk (less than 8% mortality risk on the STS score) and had the concomitant indication for CABG and AAOR between December 2005 and August 2021 were included. Patients were assigned to one of three strategies: Group 1 underwent one-stage surgery for CABG and AAOR, Group 2 underwent two-stage surgery within the same in-patient stay, and Group 3 underwent two-stage surgery in a new in-patient stay within six months.

Results: 27, patients with simultaneous requirements of CABG and AAOR were identified, with a mean age of 69.5 ±6.1 years and 92.6% were male. The most common comorbidities were hypertension at 77.8% and dyslipidemia at 55.6%. The average mortality risk calculated by the STS score was 2.09% ± 1.53%. In group 1 (n=9), 1/9 had in-hospital mortality and no reinterventions were needed. In group 2 (n=10), 1/10 had in-hospital

mortality, and the most common postoperative complication was acute kidney injury 2/10. Furthermore, 2/10 required a reintervention. In group 3 (n=8), no in-hospital mortality was present, however, complications such as sepsis, atrial fibrillation, and acute kidney injury occurred in 2/8 patients each, and 2/8 required a reintervention.

Conclusion: Patients with CAD and AAA that need a concomitant surgical correction with CABG and an AAOR are uncommon in contemporary practice, given the advances in endovascular therapy. When indicated, one-stage surgery can be performed in patients with low cardiac surgical risk, proper patient selection plays a fundamental role and might be performed in experienced centers. However, two-staged surgeries at the same or different inpatient stay may be considered for asymptomatic AAA with close monitoring during the postoperative period. These findings can hold significance for addressing sociodemographic barriers in low and middle-income countries. More robust and extensive studies are needed to make clear comparisons between the different strategies.

4. Producto 4

Título: *Endovascular Embolization of a Superior Mesenteric Aneurysm in a Patient Without Celiac Trunk: A Case Report*

Journal: *Journal* of *Vascular Surgery (Q1)*

***Autores:* <u>Lina M. Sanabria-Arévalo</u>**, *Romeo Guevara, Camilo A. Polania, Juan G. Barrera-Carvajal.*

Abstract: *Objective: Visceral artery aneurysm (VAA) is a rare and critical vascular disease. Aneurysms of the superior mesenteric artery (aSMA) represent 3.2% to 5.5% of all VAA. In addition, 22% of all VAA present as a vascular emergency either rupture or dissection. Due to the high mortality rate, an increase in open and endovascular procedures has been reported. However, strong evidence is scarce.*

Methods: A 55-year-old obese male patient presented to our consult due to an incidental aSMA in a postoperative tomography scan of the previous orchidectomy. Laboratory testing was normal, and the patient did not refer any mesenteric angina symptoms. However, a computed tomography angiography revealed a saccular aneurysm of the proximal portion of the SMA with a partially thrombosed aneurysmal sac of 21 mm, without evidence of a celiac trunk (Figure 1).

Results: Initial arteriography was made through brachial access, showing an aSMA with extensive collateral flow secondary to the absence of the celiac trunk. A 22.0 +/- 3.5 mm bare stent was placed, and sac embolization was performed with different-sized coils. Final arteriography showed successful embolization of the aneurysmal sac (Figure 2). After 2 days of hospitalization, the patient was discharged with no complications.

Conclusions: Consistent with other professional fields, surgeons' transformational leadership enhances team behavior, especially during the most complex operative phases.

This suggests that encouraging surgeons to learn and actively implement a transformational leadership style is meaningful to enhance patient safety and team performance.

5. Producto 5

Título: *Aneurisma aórtico abdominal con compromiso aislado de las ramas abdominales viscerales: Reporte de caso.*

Congreso: *25° Congreso Colombiano de Cirugía Vascular y Angiología.*

Autores: ***Lina M. Sanabria-Arévalo****, José V. Álvarez-Martínez, Vladimir Barón.*

Abstract: *Introducción: Los aneurismas aórticos abdominales con compromiso aislado de las ramas abdominales viscerales son lesiones extravagantes que mantienen la integridad de la porción torácica descendente e infrarrenal de la Aorta. A fecha de hoy, no existe evidencia robusta sobre este tipo de lesiones.*

Objetivos: Describir el caso de un aneurisma aórtico abdominal (AAA) selectivo al segmento visceral con compromiso aislado del tronco celíaco (TCL), arteria mesentérica superior (AMS) y arterias renales (AR), reparado con una endoprótesis fenestrada.

Metodología: Se realizó un estudio observacional, descriptivo, tipo reporte de caso.

Resultados: Paciente femenina de 72 años hipertensa e hipotiroidea, con antecedente de insuficiencia venosa crónica y cáncer de mama; en quien se detecta incidentalmente un AAA asintomático en AngioTC con diámetro de 59 mm y 72 mm de longitud, que compromete exclusivamente el origen del TCL, AMS y ambas AR. Dada la extensión de la lesión, se realizó PETscan descartando etiología infecciosa. Asimismo, debido a estado comórbido y a estudio de perfusión miocárdica con isquemia anteroapical leve, se consideró alto riesgo para cirugía convencional, por lo que se planteó reparación endovascular como primera elección. Ante la amenaza de isquemia medular, se insertó catéter de derivación peridural. Posteriormente, frente a deterioro clínico, la paciente fue intervenida de manera urgente, realizando despliegue de endoprótesis fenestrada (COOK, T-Branch) para el TCL, AMS y

ambas AR. Se fijó una endoprótesis recta (ZDEG) para el segmento aórtico supracelíaco y se emplearon stents cubiertos para las ramas viscerales. La paciente presentó una adecuada evolución postoperatoria y fue dada de alta al octavo día.

Conclusiones: Los aneurismas aórticos que involucran las ramas abdominales viscerales suelen manifestarse como dilataciones toracoabdominales o AAA suprarrenales. Nuestro caso exhibe una presentación única que merece ser contemplada para futuras clasificaciones anatómicas estandarizadas de la patología aortica aneurismática.

6. Producto 6

Título: *Asistencia con presentación de caso: Síndrome Leriche, Fellows Academy, Boston Scientific, Bogotá, Colombia, 2023.*

7. Producto 7

Título: *Asistencia, New York Endovascular Summit, New York, United States of America, 2023.*

8. Producto 8

Título: *Asistencia, Venous Symposium, New York, United States of America, 2023.*