



ORIGINAL ARTICLE

Limb length shortening after arterial cannulation in infancy[☆]



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KEYWORDS

Limb length shortening;
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Abstract

Objectives: The aim of this study was to assess the relationship between arterial cannulations and the development of limb length discrepancies in childhood or impaired growth of the proximal femur.

Material and methods: A retrospective study was conducted on 300 children who required arterial cannulation and/or cardiac catheterisation during childhood in relation to congenital heart diseases. Seven of these patients were referred from the Paediatric Cardiology clinic due to a limb length discrepancy and/or proximal femoral deformities.

Results: Seven children, with a mean age of 10 years, were referred to our clinic. The mean length discrepancy was 2.7 cm, and was more frequent on the right side. Three of the patients presented with proximal femoral deformities: two cases of caput valgum and one of bilateral physeal arrest of the greater trochanter. All children were initially treated with a shoe lift in the shortest limb. One of them required a tibial lengthening and two others are awaiting a similar procedure.

Conclusion: We recommend clinical and radiological follow-ups of patients who have undergone catheterisation during their infancy due to the relationship between these techniques and the risk of developing a limb length discrepancy.

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PALABRAS CLAVE

Discrepancia de longitud;
Neonatos;
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Discrepancia de longitud de los miembros inferiores tras canalización arterial en niños**Resumen**

Objetivos: Conocer la posible asociación entre la realización de canalizaciones arteriales con el desarrollo de discrepancias de longitud en los miembros inferiores y de alteraciones del crecimiento del fémur proximal en la infancia.

Material y métodos: Se realiza un estudio retrospectivo de 300 niños que precisaron una canalización arterial y/o un cateterismo cardíaco durante la infancia en relación con la existencia de patología cardiovascular congénita. Durante su seguimiento en la consulta de cardiología pediátrica, a 7 de ellos se les detectó una discrepancia de longitud de los miembros inferiores (MM II) por lo que fueron remitidos a nuestras consultas externas para estudio.

Resultados: Los 7 pacientes fueron valorados en nuestra consulta con una media de 10 años de edad. La media de discrepancia de longitud fue de 2,7 cm, más frecuente en el lado derecho a expensas de fémur y tibia. Tres de los pacientes presentaron una deformidad de la extremidad proximal del fémur: 2 casos de caput valgum y uno de apofisiodesis aislada bilateral de trocánter mayor. Todos los niños fueron tratados inicialmente con un alza en el miembro más corto. Uno de ellos precisó un alargamiento tibial y 2 de ellos están a la espera de alargamiento para la compensación de la discrepancia.

Conclusión: Es recomendable el seguimiento clínico y radiológico de los pacientes a los que se les haya realizado un cateterismo en su primera infancia por la relación que existe entre estas técnicas y el riesgo de desarrollar una discrepancia de longitud en el miembro inferior.

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Introduction

Length discrepancy between the lower limbs (LL) is one of the most frequent causes for consultation in infantile orthopaedics. In general, the cause of the discrepancy is easily identifiable, with the most common being¹ posttraumatic, postinfectious, congenital, palsy, etc. Discrepancies with a vascular origin are exceptional, with the most frequent being limb lengthening due to vascular malformations, like those found in Klippel–Trénaunay–Weber syndrome. Shortening discrepancies with a vascular origin are even more infrequent and caused by an arterial vascular disorder which is generally known.

Heart catheterisation is a complex and invasive procedure which consists in introducing a catheter in order to assess the anatomy of the heart and coronary arteries, as well as to estimate the function of the heart, measure the pressures of the heart cavities, etc. It can even be used with a therapeutic purpose, to close interatrial communication, *ductus arteriosus* with devices, valvuloplasties, embolisation of collaterals, etc. This technique is commonly employed in the study of congenital cardiopathies affecting newborns.

The most commonly used technique to cannulate femoral vessels is Seldinger's technique,² described in 1953, which makes it possible to cannulate blood vessels without requiring a surgical access. The considerable advances in catheter size and materials have enabled vascular access in increasingly smaller children. Nevertheless, cannulating femoral vessels in a newborn is still not without risks. Different complications have been described,³ including vascular perforations, sepsis, incorrect placement of the catheter and

tear thereof, fatty embolisms, vascular damage caused by the size of the catheter, etc. These complications, less clinically surprising in newborns than in adults, may initially go unnoticed and give rise to long-term growth disorders in the proximal end of the femur and length discrepancies between the LL.

The present work analyses patients with LL length discrepancies and/or alteration of proximal femoral growth who underwent catheterisation during childhood.

Material and methods

A descriptive observational study was carried out, with retrospective data collection of 300 patients undergoing cardiac catheterisation between 1992 and 2004.

A total of 358 catheterisations were performed on 300 patients at our centre during the study period. The causes were congenital cardiopathy or systemic pathology in the first days of life, requiring admission at the intensive care unit (ICU).

Out of the 300 cases, 7 patients (5 girls and 2 boys) were referred to our clinic from the Paediatric Cardiology Service, due to clinical discrepancy of LL length. Each child was clinically and radiographically examined at our outpatient clinic. Data collected included age, gender, duration of monitoring, type of congenital cardiopathy, perinatal problems, number of catheterisations undergone by the patient and at what age, and complications associated with the procedures. Physical explorations were carried out and complementary imaging tests were obtained: LL telemetries to study the LL length discrepancy and hip radiographs to assess the proximal end of the femur.

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