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### Case report

# Ultrasound-guided rectus sheath block for an umbilical hernia repair in a patient with Wolff-Parkinson-White syndrome: A case report<sup>☆</sup>



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#### ABSTRACT

Perioperative management of patients with Wolff-Parkinson-White syndrome requires a special care by anaesthesiologists. Choosing the most suitable anaesthetic technique is very important. Both general anaesthesia and neuroaxial blockade may result in haemodynamic instability and arrhythmias development. Rectus sheath block is considered as a useful regional technique for umbilical surgery in patients at high-risk of cardiopulmonary complications.

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### Bloqueo de la vaina de los rectos ecoguiado para reparación de hernia umbilical en un paciente con síndrome de Wolff-Parkinson-White: reporte de un caso

#### RESUMEN

El manejo perioperatorio de los pacientes con síndrome de Wolff-Parkinson-White requiere de un especial cuidado por parte de los anestesiólogos. Elegir la técnica anestésica más adecuada es de vital importancia. Tanto la anestesia general como el bloqueo del neuroeje puede resultar en inestabilidad hemodinámica y desarrollo de arritmias. El bloqueo de la

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Bloqueo nervioso  
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vaina de los rectos se considera una técnica regional muy útil para la cirugía umbilical en los pacientes con riesgo de complicaciones cardiopulmonares.

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## Introduction

Wolff-Parkinson-White (WPW) syndrome, a congenital heart condition, is the most common of the pre-excitation syndromes. The activation of an accessory atrioventricular (AV) pathway bypasses the AV node and produces ventricular activation over the normal pathway.<sup>1</sup> Its prevalence ranges from 0.1 to 3 cases per 1000.<sup>2</sup> Most patients remain asymptomatic. The incidence of arrhythmias developed by these patients are 80% supraventricular tachycardia, between 15% and 30% atrial fibrillation, and 5% atrial flutter.<sup>3</sup> The clinical presentation can vary from vertigo, palpitations, breathlessness, chest tightness, to sudden death. Anaesthetic management in these cases is a challenge for anaesthesiologists, giving a real important role to the techniques that avoid the haemodynamic fluctuations. Rectus sheath block (RSB) has been described both as a sole anaesthetic<sup>4</sup> and for preoperative analgesia in procedures involving midline (bilateral block) or paramedial incisions (unilateral block). It provides somatic pain relief for abdominal wall structures superficial to the peritoneum, from the xiphoid process to the symphysis pubis. For surgery deep to the peritoneum there is usually a component of deeper visceral pain for which systemic medication is usually administered. In the 1950s several studies reported on the use of local anaesthetic catheters placed by surgeons to reduce post operative pain post gynaecological and general surgical procedures.<sup>5-7</sup> Since 2007 the technique has further developed to include ultrasound guidance (increasing the success rate and reducing the incidence of complications) and placement of rectus sheath catheters.

## Case report

We report the case of a 51-year-old, 82 kg male with hypertensive heart disease and Wolff-Parkinson-White syndrome proposed for an umbilical hernia repair. The patient had 1 or 2 well-tolerated episodes each two months of palpitations with a discontinuous, variable-duration, inframamilar stabbing pain, with no other symptoms. An E.C.G. was performed preoperatively showing short PR, delta wave, QS in lead II, III and aVF, negative T in I and aVL and frequent ventricular extrasystoles. The echocardiography exam was normal. He had been prescribed diltiazem 60 mg/12 h and acetylsalicylic acid 100 mg/24 h, which was continued until the time of operation.

After monitoring pulse oximeter (SpO<sub>2</sub>), ECG (lead II, V) and non-invasive blood pressure, a bilateral ultrasound-guided (L25n/13-6 MHz transducer; SonoSite, Inc.<sup>TM</sup>, Bothell, WA, USA) rectus sheath block was performed with a UPA

23 G × 50 mm needle (Temena group, Germany) under a Marsh model target controlled infusion of propofol (2 ng/ml). Bilaterally, all the structures were identified and colour Doppler was used for avoiding vascular structures (inferior and superior epigastric vessels run in the posterior rectus sheath). Under direct vision with an in-plane real-time technique the needle tip was advanced posterior to the rectus muscle and above the underlying rectus sheath, from lateral to medial, watching the local anaesthetic dissects the rectus muscle away from the posterior rectus sheath. Seven millilitres of 0.5% bupivacaine plus and 7 ml of 1% lidocaine were used for each side at first try. Surgery was well tolerated and no haemodynamic instability or any kind of arrhythmia was developed. The patient was monitored in the post-anaesthesia care unit period showing no complications and was discharged to the ward after 2 h and home 24 h later.

## Discussion

Historically, the possibility of the existence of atrioventricular accessory pathways was first raised by Stanley Kent in 1913.<sup>8</sup> WPW syndrome was first described in 1930 in a series of patients in whom ECG showed a short P-R interval.<sup>1</sup> Perioperatively, even asymptomatic patient can develop arrhythmias, therefore meticulous monitoring is essential. Its anaesthetic management should be aimed at avoiding tachyarrhythmias and sympathetic stimulation. Regional anaesthesia is preferred over general anaesthesia and epidural over spinal due to controlled and segmental block with better haemodynamic stability.<sup>9-13</sup> Sympathetic blockade of spinal anaesthesia can lead to bradycardia and hypotension and drugs used to treat these complications may favour appearance of life-threatening arrhythmias, particularly beta-1 agonist. Digitalis and verapamil are contraindicated for WPW. If associated with atrial fibrillation, beta-blockers and calcium-antagonists should be avoided.

Nowadays, RSB and local anaesthetic infiltration of the surgical site are used for providing both anaesthesia and postoperative analgesia for umbilical hernia repair. The RSB anaesthetises the 9th, 10th and 11th intercostal nerves providing somatic anaesthesia to the abdominal wall structures superficial to the peritoneum.<sup>4</sup> For deeper surgery, analgesia must be complemented with intravenous medication in order to avoid the sympathetic response to the pain. Gurnaney has shown a superiority of ultrasound-guided RSB over local anaesthetic infiltration of the surgical site for analgesia in the perioperative period in children.<sup>14</sup> RSB remains a useful regional anaesthetic technique in the high-risk patient in whom haemodynamic should be maintained due to its capability to avoid sympathetic block produced by neuroaxial techniques, so it is preferred over other types of blockades

in these patients. A catheter can be placed in the rectus sheath to provide postoperative analgesia, being particularly useful when neuroaxial techniques are contraindicated. Parsons showed an equivalent analgesic effect to epidurals in 20 patients who underwent a radical cystectomy.<sup>15</sup> It is an excellent option for intensive care patients. It has shown to allow timely wean of sedation and extubation.<sup>16</sup> Ultrasound guidance has been shown to improve the performance of RSB, ilioinguinal block and transversus abdominal plane block. It provides real-time information about the needle tip location and the local anaesthetic delivery to the desired location plus avoiding vascular structures when colour Doppler is used. This results in using lower doses of local anaesthetics decreasing the risk of local anaesthetic systemic toxicity. Furthermore, it facilitates RSB placement so the anaesthesiologist can directly visualize relevant structures, reducing risk of peritoneal puncture, vascular and visceral injury while increasing its success rate.

### Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this investigation.

**Confidentiality of data.** The authors declare that the procedures followed were in accordance with the ethical standards of responsible committee on human experimentation and with those of the Code of Ethics of the World Medical Association Declaration of Helsinki.

**Right to privacy and informed consent.** The authors must have obtained the informed consent of the patients and/or subjects mentioned in the article. The author for correspondence must be in possession of this document.

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### Conflicts of interest

The authors have no conflicts of interest to declare.

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