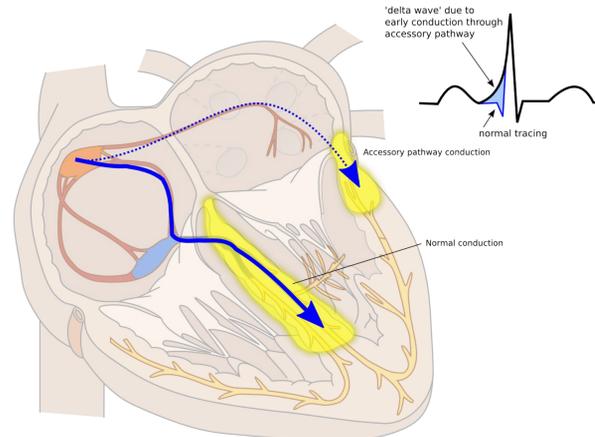


# Atypical Rhabdomyolysis in a 16-year-old Male Water Polo Player: A Case Study

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## Background Information

- Exertional rhabdomyolysis (ER) is a condition when a breakdown and necrosis of skeletal muscle occur after the engagement in physical activity<sub>3</sub>
- Typically evolves from strenuous eccentric exercise at a high intensity<sub>1</sub>
- An increase in intracellular ionized calcium in the cytoplasm and mitochondria causes the cell death in the skeletal muscle<sub>3</sub>
- Patients typically complain of delay-onset muscle soreness (DOMS), localized edema, and decreased muscle strength<sub>2</sub>
- Relatively uncommon<sub>2</sub>
- Patients are typically treated with intravenous fluids<sub>1</sub>



ECG PEDIA.ORG

Figure 2: Conduction through the accessory pathway

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[https://en.ecgpedia.org/wiki/Ventricular\\_pre-excitation\\_\(Wolff-Parkinson-White\\_pattern\)](https://en.ecgpedia.org/wiki/Ventricular_pre-excitation_(Wolff-Parkinson-White_pattern))

## Conclusion

- Athlete did not present with common signs of exertional rhabdomyolysis involving DOMS, myoglobinuria, or localized edema<sub>2</sub>
- Patient presented with symptoms of chest pain, shortness of breath, and severe muscle soreness.
- A typical patient with exertional rhabdomyolysis normally participates in strenuous exercise and shows signs and symptoms over multiple days<sub>1</sub>

## Interventions

- Patient received intravenous hydration
- Tracking of creatine kinase levels with blood tests
- Catheter ablation of the extra electrical pathway in the heart
- Following heart surgery, the patient was advised to limit activity and drink at least 3 liters a day

## Clinical Presentation

- A 16-year-old male water polo player was participating in practice when they complained of having chest pain and painful soreness throughout the whole body
- The athletic trainer responded and took vital signs before EMS arrived and found an abnormally high heart rate
- The patient was sent to the hospital and diagnosed with atypical rhabdomyolysis
- The patient was treated with intravenous hydration and monitored for creatine kinase levels
- They were also diagnosed with Wolff-Parkinson-White Syndrome (WPW), which means there is an extra electrical pathway in the heart
- The patient was allowed to leave the hospital after 48 to 72 hours of no recurrent symptoms after the time of the injury
- They were instructed to limit physical activity and drink at least 3 liters of water per day
- The patient underwent an intracardiac electrophysiology study after 2 weeks and was noted to have low to moderate risk for sudden cardiac arrest
- An ablation procedure was done to the extra pathway in the heart
- The athlete returned to play after completing a slow progression cardio program and no recurrent symptoms

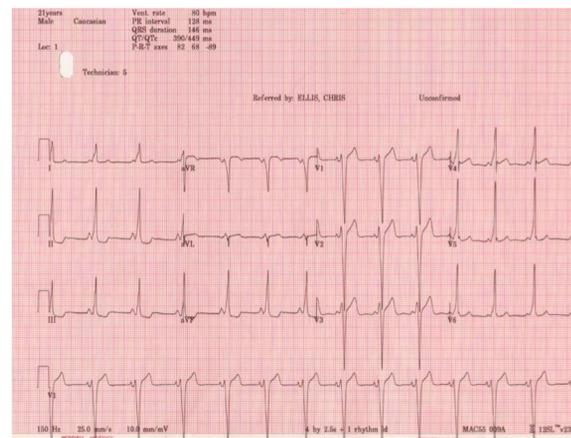


Figure 3: Classic wolff-parkinson-white syndrome ECG

Retrieved from

<https://emedicine.medscape.com/article/159222-overview>

## Diagnostic testing

- Patient received a blood test to diagnose acute rhabdomyolysis
- Patient underwent an electrocardiograph to diagnose the Wolff-Parkinson-White syndrome
- The patient also underwent an intracardiac electrophysiology study to identify the location of the extra electrical pathway in the heart for the WPW syndrome

| Table 2: Serum Lab Values in Adults |                                      |                     |
|-------------------------------------|--------------------------------------|---------------------|
|                                     | Normal Values                        | In Rhabdomyolysis   |
| CK                                  | M: 55-170 IU/L<br>F: 30-135 IU/L     | ↑                   |
| CK-MM                               | 100%                                 | ↑                   |
| BUN: creatinine ratio               | 10:1                                 | Early: ↓<br>Late: ↑ |
| Anion Gap                           | 12+/-2                               | ↑                   |
| Phosphorus                          | 3-4.5 mg/dl                          | ↑                   |
| Calcium                             | 9-10.5 mg/dl                         | ↓                   |
| Uric Acid                           | M: 2.1 - 8.5 mg/dl<br>F: 2-6.6 mg/dl | ↑                   |
| Albumin                             | 3.2 - 4.5 mg/dl                      | ↓                   |
| Hematocrit                          | M: 42-52%<br>F: 37-47%               | ↓                   |
| Potassium                           | 3.5-5 mg/dl                          | ↑                   |

Figure 1: Serum lab values

Retrieved from

<https://www.physio-pedia.com/Rhabdomyolysis>

## Clinical Bottom Line

- When a patient complains of severe muscle cramping and is experiencing symptoms such as dark colored urine after intense physical activity, clinicians should always suspect ER<sub>2</sub>
- During the diagnosis of rhabdomyolysis, the possibility of multiple different signs and symptoms may occur<sub>2</sub>
- Clinicians must be aware of what to look for in an athlete who may be susceptible to getting rhabdomyolysis<sub>2</sub>
- This can be prevented but potentially life-threatening if not recognized in a timely manner<sub>1</sub>

## References

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