proLékaře.cz | 15.11.2026

AUTOPSY FINDINGS

The subject was 156 cm tall and weighed 63 kg. Xanthomous lesions were scattered over the face. The heart weighed 452 g and yellow discoloration was observed in some areas of myocardium (Fig. 1). Moderate coronary sclerosis was noted, but no significant stenosis was observed. Histological examination of the myocardium revealed the replacement of the right ventricular myocardium by adipose tissue and fibrosis (Fig. 2). No myocardial necrosis and no findings indicating acute ischemic heart disease as the cause of death were observed. ARVC/D was diagnosed with microscopic examination and the cause of death was determined to be fatal arrhythmia caused by ARVC/D.

Immunohistological examination with tenascin C was performed in order to assess myocardial remodeling. A primary antibody to tenascin C (BC-24, Abcam plc. Tokyo, Japan) that reflects tissue remodeling with high sensitivity was used. Conditions were set for a positive control (invasive ductal carcinoma of the breast), antigen retrieval was conducted with proteolytic enzymes, and the antigen was visualized using the polymer staining technique. Masson trichrome staining was also performed to evaluate fibrosis. Immunohistostaining with tenascin C revealed positive findings in the myocardial stroma (Fig. 3).

The left lung weighed 417 g while the right lung weighed 444 g. Macroscopic findings indicated the presence of chronic obstructive pulmonary disease accompanied by emphysema. Histological examination indicated organizing pneumonia. There was a moderate volume of sputum in the airway, but no findings indicated suffocation. The brain weighed 1258 g and no lesions such as hemorrhage were observed.

DISCUSSION

ARVD is associated with highly variable clinical presentation such as ventricular tachycardia, syncope, right ventricular dysfunction and sudden death (5). Although several theories have been proposed and different genetic variants have been described, the accurate etiopathogenesis of ARVD is still unknown (5).

While it has been previously reported that large-scale myocardial remodeling such as myocarditis or myocardial infarction can be detected, preliminary investigation has indicated that tenascin C positivity indicates focal fibrosis with no acute myocardial changes. In some cases, it was possible to detect minute fibrosis difficult to identify with HE staining (unpublished data). This staining may be useful for the detection of myocardial remodeling in progress and the evaluation of myocardial disease associated with remodeling (unpublished data).

Here, immunostaining with tenascin C made it possible to visualize myocardial remodeling in progress in the myocardium of an ARVD case, suggesting its usefulness as a tool for analyzing cases of arrhythmia. All pathomorphological changes (pathomorphome) in myocardium including immunohistochemistry should be etiothanatologically analyzed routinely

ACKNOWLEDGEMENTS

I thank Mr. Shuichi Matsuda for his excellent technical assistance. This work was supported in part by a Grant-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology, Japan (24790640 to T.K).

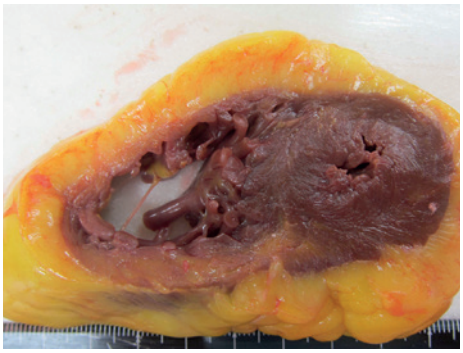

Fig. 1. Myocardium section. Yellow discoloration is apparent, centering on the right ventricle. No clear findings of infarction.

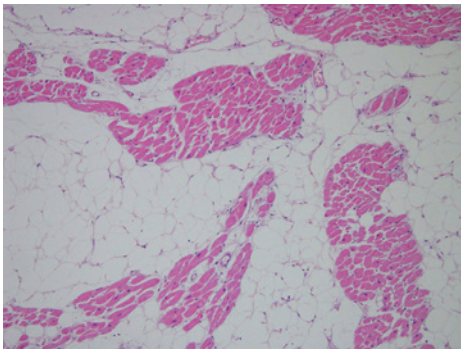

Fig. 2. Histology (hematoxylin and eosin staining) of the myocardium. Apparent replacement of myocardium by fat tissue. No myocardial necrosis.

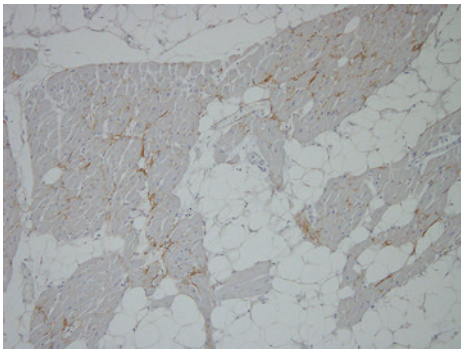

Fig. 3. Immunohistological staining with tenascin C. Positive findings observed in the myocardial stroma.

REFERENCES

1. **Iyer VR, Chin AJ.** Arrhythmogenic right ventricular cardiomyopathy/Dysplasia (ARVC/D). *Am J Med Genet C Semin Med Genet* 2013; 163(3): 185-197.
2. **Thiene G, Basso C, Danieli G, Rampazzo A, Corrado D, Nava A.** Arrhythmogenic right ventricular cardiomyopathy a still underrecognized clinic entity. *Trends Cardiovasc Med* 1997; 7(3): 84–90.
3. **Romero J, Mejia-Lopez E, Manrique C, Lucariello R.** Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC/D): A Systematic Literature Review. *Clin Med Insights Cardiol* 2013; 7: 97-114.
4. **Imanaka-Yoshida K.** Tenascin-C in cardiovascular tissue remodeling: from development to inflammation and repair. *Circ J* 2012; 76(11): 2513-2520.
5. **Akan O, Cetin S, Eren B, Durak D, Türkmen N, Gündoğmuş UN.** Death due to Arrhythmogenic Right Ventricular Dysplasia: A case report. *Soud Lek* 2013; 58(3): 39-41.

OZNÁMENÍ

S radostí oznamujeme, že dne 19.6.2014 úspěšně obhájil habilitační práci s názvem: *„Sebevražda střelnou zbraní - soudnělékařská fenomenologie vybraných znaků“* člen naší redakční rady, místopředseda ČSSLST ČLS JEP a přednosta Ústavu soudního lékařství v Hradci Králové pan MUDr. Petr Hejna, Ph.D. MBA.

Naše srdečná gratulace.

Za redakční radu - Miroslav Hirt