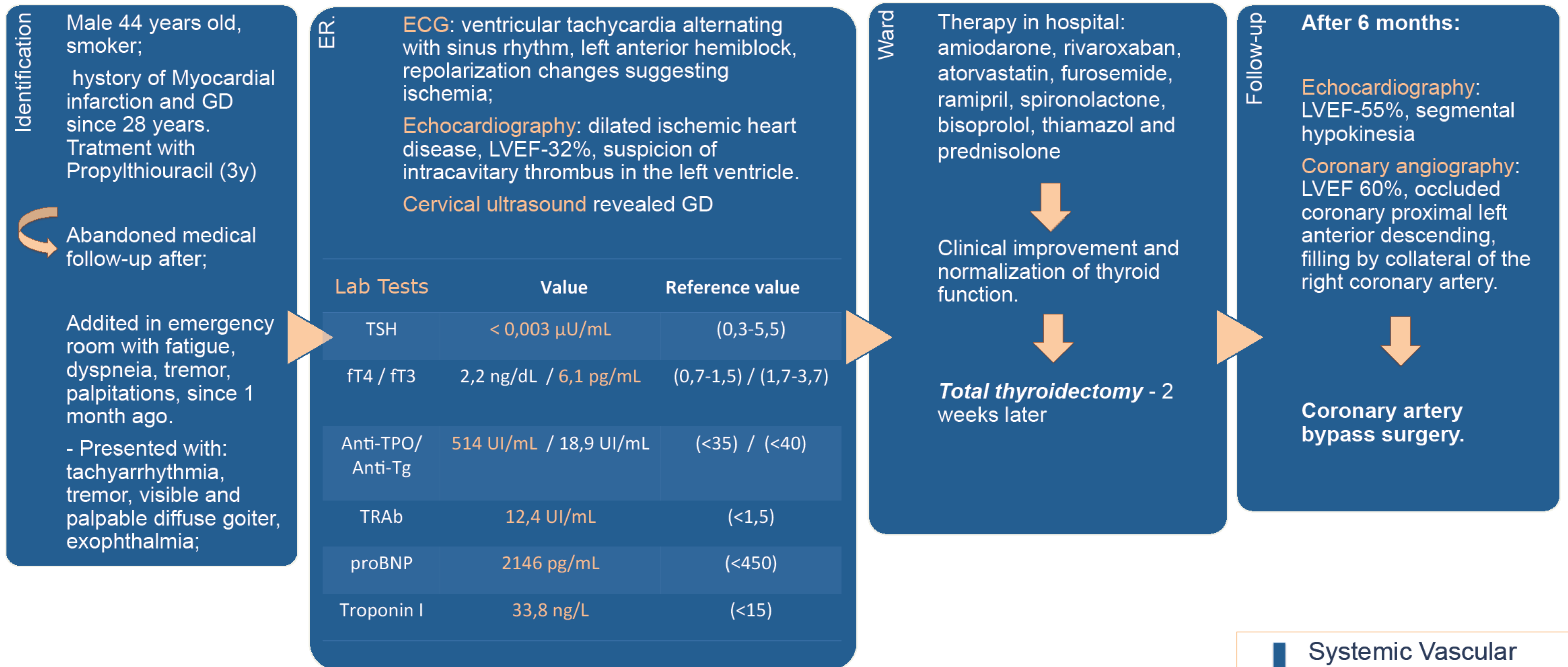


# Thyroid, the Heart and Amiodarone

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The Thyroid hormone effects on the cardiovascular hemodynamics produce a circulatory hyperdynamic state. Tachyarrhythmias and myocardial hypertrophy are the most frequent manifestations of hyperthyroidism, followed by dilated cardiomyopathy. Amiodarone is an effective antiarrhythmic medication. However, if there is a coexisting thyroid pathology, it may complicate the treatment of thyroid dysfunction. This poster illustrates a case of Graves' disease (GD) of long evolution, which illustrates the complexity of these associations.



The Hyperthyroidism induces cardiovascular events such as systolic hypertension, arrhythmias, abnormal ventricular function, hypertrophic cardiomyopathy, among others. These result of hemodynamic effects induced by thyroid hormones, either by genomic mechanisms either extranuclear/non-genomic mechanisms (Fig.1). Although exists adrenergic hyperfunction, serum level of catecholamines remain normal or low. These synergistic effects can induce increased cardiac output to about 300%. (Fig.2)

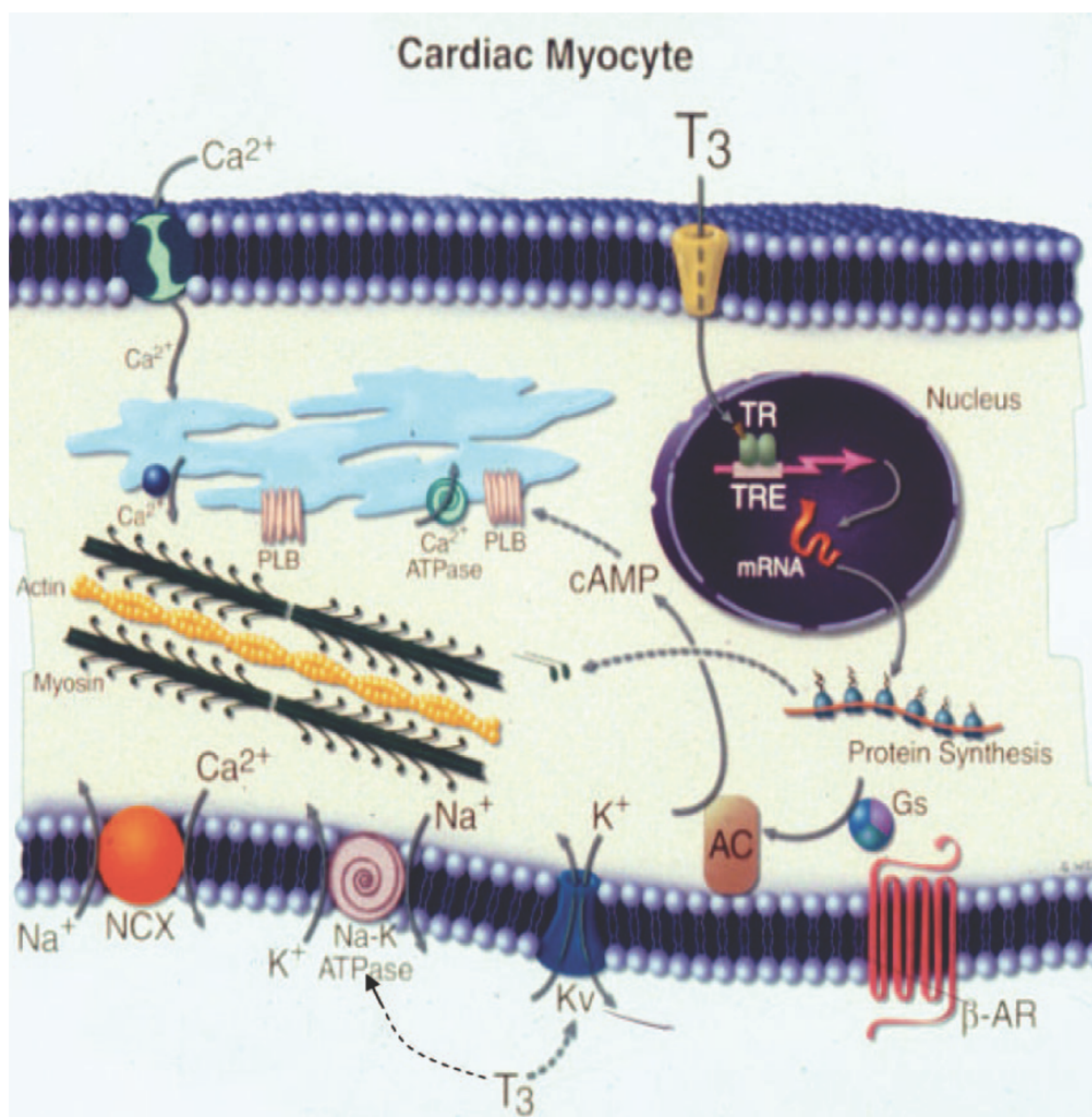


Figure 1: T<sub>3</sub> Effects on the cardiac myocyte<sup>1</sup>.

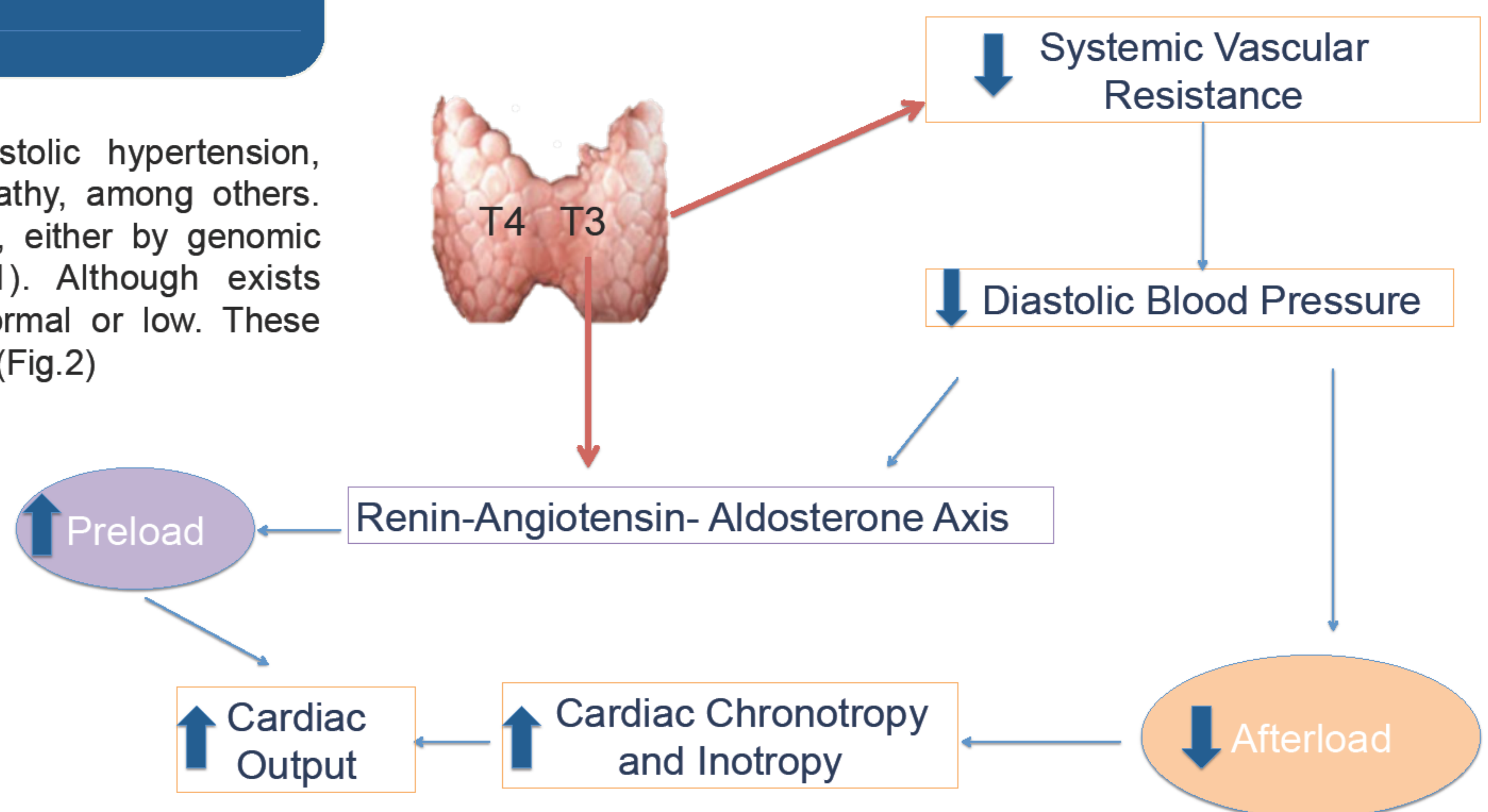


Figure 2: Thyroid effects on cardiovascular hemodynamics.

Dilated cardiomyopathy is characterized by enlargement of the left ventricle with contractile dysfunction, maintaining normal thickness of the chamber. This is an uncommon finding in young adults with hyperthyroidism, although there are some reported cases.

The underlying pathophysiology of this structural change remains uncertain. It's thought to be due to:

- direct toxic effects of excess thyroid hormone
- hyperdynamic state / increase in cardiac output
- overall effect of the above factors.

β-blockers and amiodarone, are considered as the first line for the treatment of tachyarrhythmias, because of its antiarrhythmic protective effect. Immediately, amiodarone can contribute to normalize thyroid hormones (Wolff-Chaikoff effect). However, over time, the gland escapes from this inhibitory effect and hyperthyroidism can be aggravated. Thus, short-term thyroidectomy, and after the normalization of thyroid hormones, is the best definitive treatment of GD, presenting without excessive surgical risk

This case intends to strengthen the possible reversibility of left ventricular function and improve prognosis, after control of thyroid function. It also illustrates the possible long-term consequences of nontreated hyperthyroidism.

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