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Assessment of sinoatrial node function at patients with persistent and long-standing persistent forms of atrial fibrillation after Maze III procedure combined with a mitral valve operation

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Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia, occurring in 1 – 2% of the general population*

*ESC GUIDELINES: **Death rates** are doubled by AF, independently of other known predictors of mortality

In our days, as a cardiac surgery treatment intended to eliminate AF, Cox maze III procedure considered to be the "**gold standard**" for effective surgical cure of AF

The idea is to eliminate **AF** by creating incisional scars to block atrial re-entry circulations.

Thus, according to Cox J.L. etc. the need of postoperative pacemaker implantations reaches **up to 40%** (34% of patients suffered from SSS before operation and 6% due to iatrogenesis).*

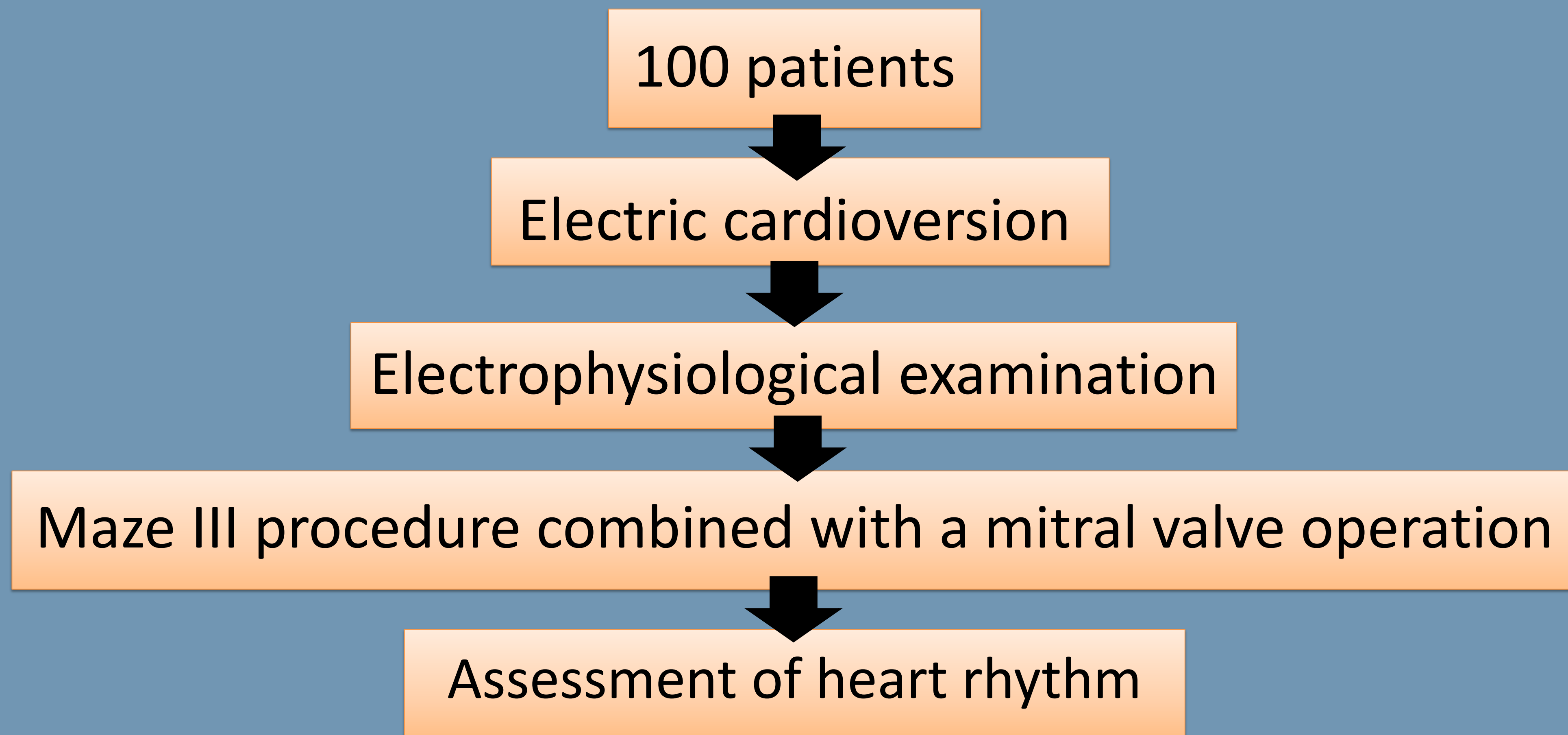
According to data of Japanese researchers, the quantity of postoperative SSS reaches **12%**. **

* Cox JL, Boineau JP et al. Successful surgical treatment of atrial fibrillation. Review and clinical update. JAMA 1991; 266:1976 – 1980.

** Akinori Sairaku, MD, Yukiko Nakano, MD et al. Prediction of sinus node dysfunction in patients with long-standing persistent atrial fibrillation using the atrial fibrillatory cycle length. Journal of Electrocardiology 45 (2012) 141–147

Considering lack of generality and some discrepancy of available data, and also absence of national recommendations concerning the matter, it seemed interesting to estimate percent of sinus node dysfunction before and after Maze III procedure at patients with persistent and long-standing persistent forms of AF.

Methods:



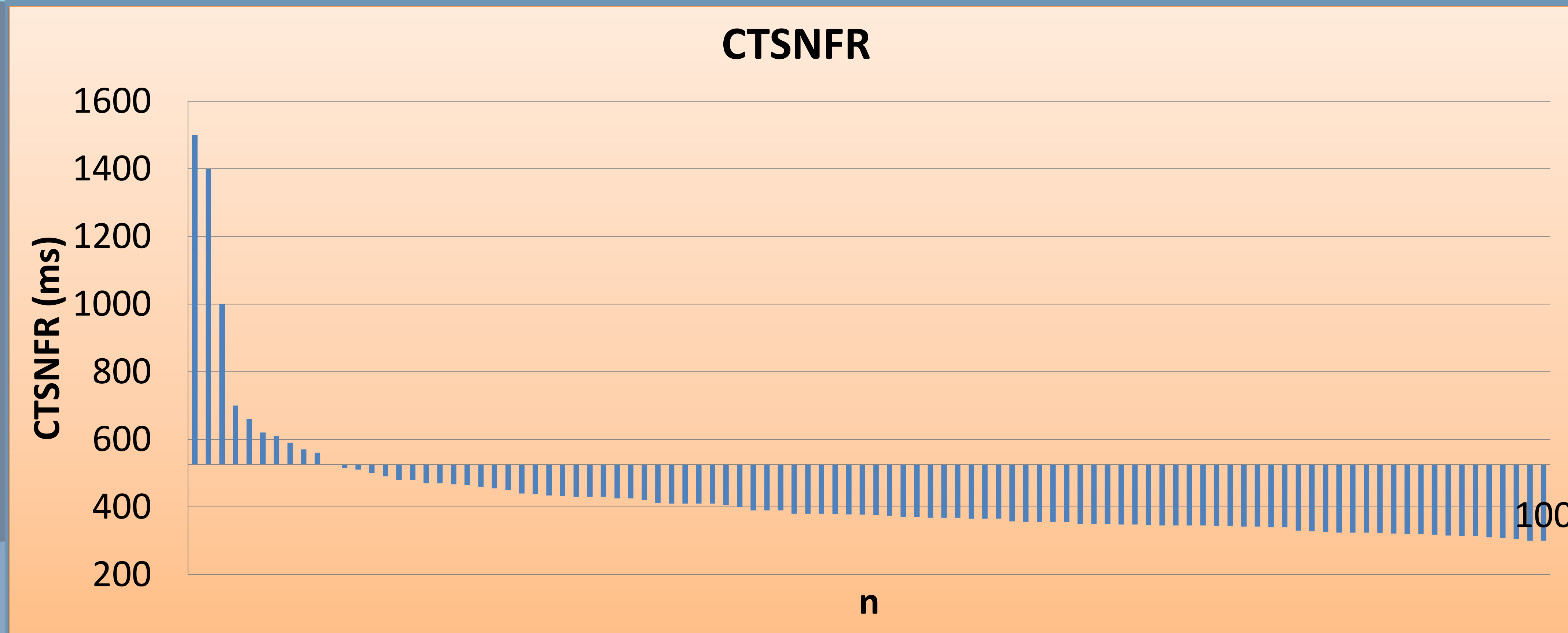
Patients characteristics

Data	Value
Number of patients (n)	100
Sex (n, male)	48
Age (years)	59,3±10,2
Duration of AF (years)	4±4,2
Antiarrhythmic drugs (quantity of drugs/patient)	3±0,45
Electric cardioversion (n)	15
Duration of valvular disease (years)	21,8±12.8
Acquired mitral valvular disease (n)	90
Left atrium (sm)	5,1±1,5
Cardio-thoracic ratio (%)	58,6±4,7

Electrophysiological study results

At the time of research at all patients sinus rhythm with a frequency from 45 to 94 bpm was registered.

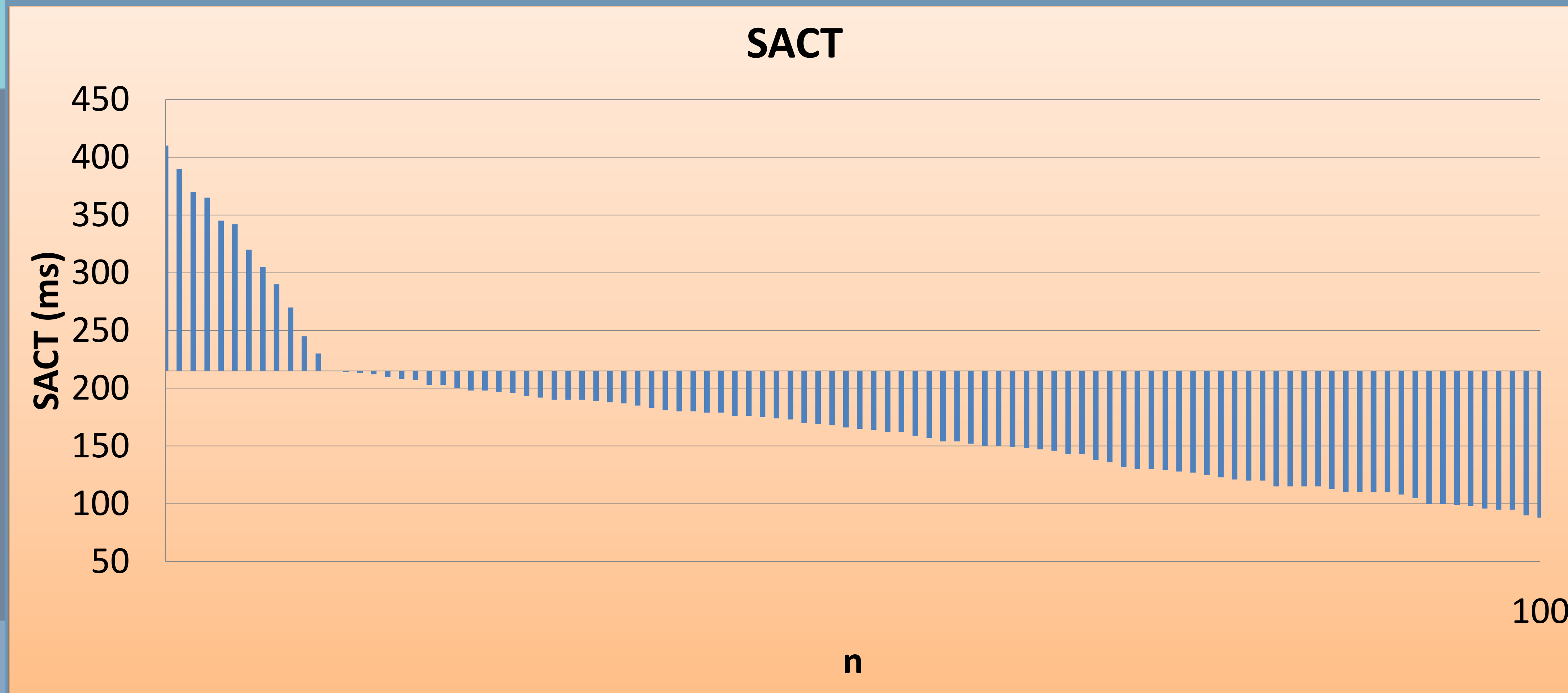
At 11% of patients pathological lengthening of corrected time of sinoatrial node function recovery (CTSNFR) – $900,3 \pm 300,6$ ms was revealed.



Distribution of values of CTSNFR at the studied patients. The normal value is supposed less than 525 ms.

Electrophysiological study results

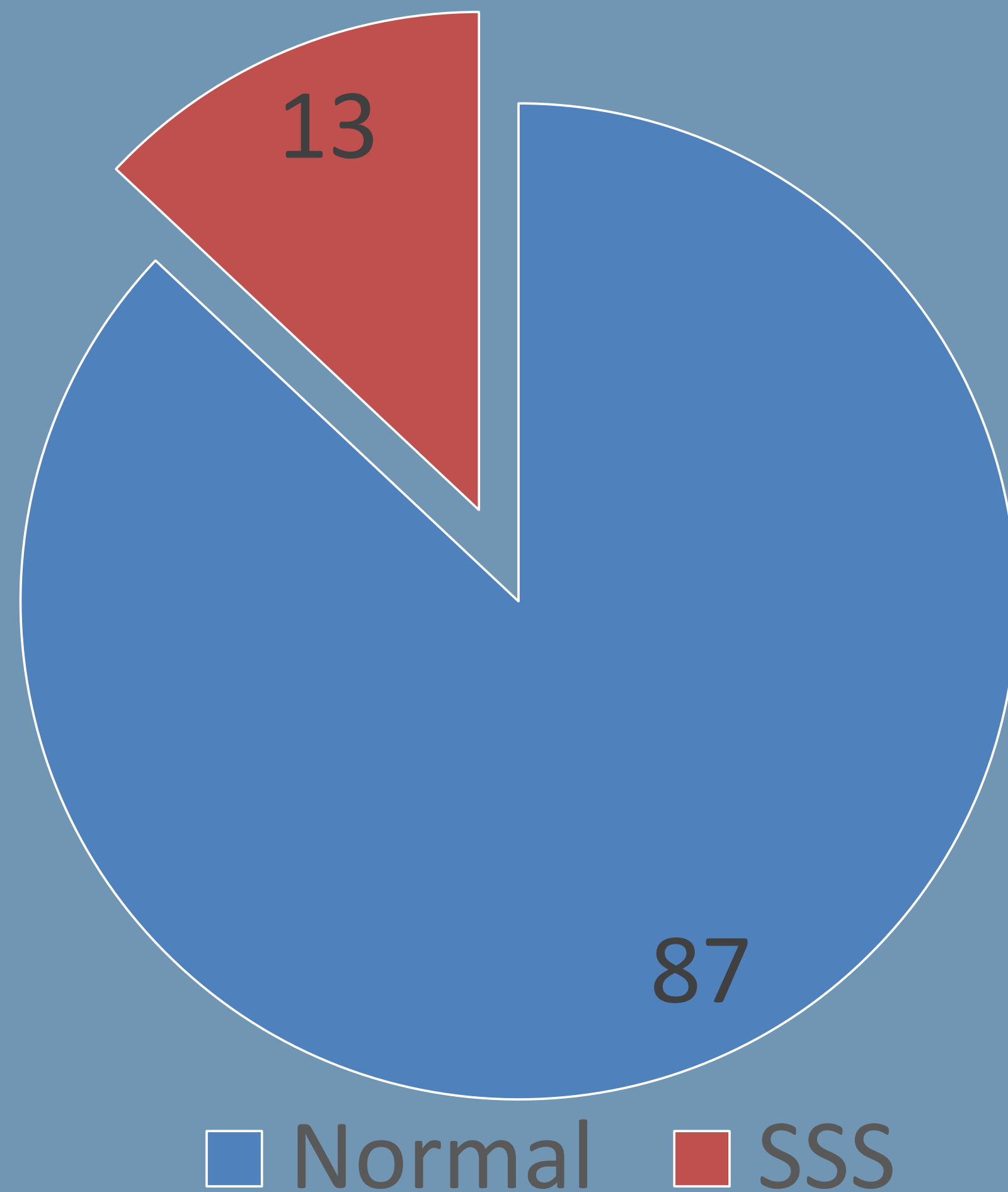
And at 13% - pathological lengthening of sinoatrial conduction time (SACT) – $340,2 \pm 80$ ms was revealed.



Distribution of values of SACT at the studied patients. The normal value is supposed less than 215 ms.

Electrophysiological study results

At 11% of patients pathological lengthening of SACT was followed by pathological lengthening of CTSNFR, but at 2% the only sign of sinus node dysfunction was lengthening of SACT. Thus, 13% of patients with FP and SSS were initially revealed.



Surgical treatment results

At 62% of patients in the first days after surgery nodal rhythm was observed, and only at 34% of patients the sinus rhythm was restored right after operation. Restoration of normal function of sinus node happened within the first week after operation when temporarily external electrocardiostimulation was required for most of patients.

Rhythm	Days after surgery				
	1 day	2 days	5 days	7 days	Discharge
Sinus	34	36	41	46	46
Atrial		13	25	24	24
Nodal	62	46	29	25	25
AF	4	5	5	5	5

Conclusion

By results of Maze III procedure combined with correction of valve disease, disposal of AF was observed at 95% of patients.

- 46% of patients had stable sinus rhythm to the moment of discharge from the hospital.
- 24% of patients had atrial rhythm with the maximum heart rate of 80-110 bpm (according to results of 24-hour Holter monitoring).
- For 25% of patients it was necessary to implant a pacemaker.

Thus, by results of EP study, 13% of patients suffered from sick sinus syndrome before operation.

From the remained 12% of patients for 9 % the indications for pacemaker were atrioventricular nodal rhythm with low heart rate and pauses more than 3 sec long. For one patient – second degree AV block (type 2) and second degree SA block (type 2). For one patient – complete heart block, and for the last one – atrial rhythm and pauses more than 3 sec long.