Title Assessment of endocavitary ablation of tachycardia by cryotherapy

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Aim

The request for assessment came from the Association of Health Insurance Funds (UNCAM). It concerns the assessment of endocavitary ablation of tachycardia by cryotherapy. In 2006, the Haute Autorité de santé (HAS) assessed methods of tachycardia ablation, and radiofrequency was the only technique retained; cryoablation was considered an investigational method.
The goal of the assessment is to determine, given the new data published since 2006, whether cryoablation is a valid method in endocavitary ablation of tachycardia compared to radiofrequency, and to specify whether it can be used in the same indications as the latter. Currently, the wording of the Joint classification of medical procedures (CCAM) describes ablation procedures for arrhythmia, but only by radiofrequency (RF). The arguments must therefore assess whether cryoablation can be included in supplement to RF in the CCAM to allow for reimbursement thereof.

Conclusions and results

Atrial fibrillation (AF) is the indication in which there is the greatest amount of cryoablation data (thirteen out of twenty-three documents). There are also two indications, typical atrial flutter and atrioventricular nodal reentrant tachycardia (AVNRT), which have data on the use of this technique in their treatment by endocavitary ablation.
In AF, the data indicate that there are no significant differences between the two endocavitary ablation techniques in terms of the rate of recurrence of AF, the procedural success rate and the duration of fluoroscopy. On the other hand, the duration of the procedure was significantly reduced during cryoablation compared to RF. No significant difference in the rate of complications was found during cryoablation compared to radiofrequency, except for paralysis of the phrenic nerve, generally occurring during the course of cryoablation but most often reversible.
In typical atrial flutter, the data, less numerous than for AF, show no significant difference between cryoablation and RF in terms of procedural success rate and lack of flutter recurrences. On the other hand, compared to RF, the duration of the procedure was significantly longer during cryoablation, although the duration of the fluoroscopy was shorter.
In AVNRT, there is no significant difference between the two techniques in terms of the success rate of the procedure. However, the rate of permanent atrioventricular block (AVB) is significantly higher during an RF endocavitary ablation, the duration of the fluoroscopy shorter with cryoablation, but long-term success (recurrences) lower with RF. It may seem therefore more appropriate to use cryoablation in this indication when preference is given to surgical safety (anatomical risk) and also in children (less exposure to radiation).
In other indications (atypical atrial flutter, atrial tachycardias, sinus tachycardias, Wolff-Parkinson-White syndrome and ventricular tachycardias), the data are insufficient to reach a conclusion.
Consultation of the stakeholders made it possible to obtain additional information on the indications of cryoablation, on the dissemination, as well as on the conditions for performing cryoablation.
All of the stakeholders agree with the critical analysis of the literature reviews on the place of cryoablation in the management of tachycardias in the three primary indications: AF, typical atrial flutter and AVNRT. According to the participants, the rate of substitution of RF with cryotherapy would be 20-50% for AF and 20-25% for AVNRT.
According to the stakeholders, it would be possible to use cryoablation in other tachycardias with the goal of increasing the safety of the procedure, especially in case of proximity of the foci to the normal conduction pathways, and to increase the stability of the catheter thanks to the phenomenon of cryoadhesion.
The conditions for performing cryoablation are similar to those of RF, apart from the need to have an “Anaesthetic Gas Scavenging System” (AGSS) outlet due to the emission of nitrogen-containing gases by the cryoablation console.

Finally, the results are consistent as to the effectiveness and low frequency of complications of cryotherapy compared to those of radiofrequency during endocavitary ablation of tachycardia. However, a short follow-up (one to two years) and a heterogeneity of the studies in the meta-analyses should be noted.
Cryotherapy is therefore indicated as an alternative to RF in the following three indications: AF, typical atrial flutter and AVNRT. In these indications, RF and cryotherapy have a comparable efficacy and safety profile. In the other indications, the use of cryotherapy is possible to improve the safety of the procedure and to increase catheter

stability when the foci are close to normal conduction pathways, in particular in Wolff-Parkinson-White Syndrome and inappropriate sinus tachycardia.
HAS emphasises that practice of the cryoablation technique must remain within the competence of heart rhythm specialists already practising endocavitary ablation by RF, given the complex and potentially dangerous nature of this technique if the procedure is not mastered.

Methods

The assessment method consisted of an analysis of the literature reviews and a consultation of professionals designated by the National Professional Council of Cardiology (stakeholders).
Twenty-three documents were selected, including ten good practice guidelines, four technological assessment reports and nine meta-analyses.

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