

Pacemaker and AV Node Ablation for AF

Why treat AF?

There are two main reasons for treating Atrial Fibrillation. The first priority is to minimise any risk related to AF due to blood clot and this is discussed in other fact sheets on anticoagulation (see AFA Fact Sheets on Aspirin and Warfarin). The second reason is to relieve the symptoms that are caused by the heart rhythm being irregular and at times too fast or too slow. In principle, the best way is to avoid the particular causes or triggers of Atrial Fibrillation and the second best way is to restore a normal rhythm by electrical cardioversion, drug treatment or specific ablation of the parts of the heart responsible for AF, usually the left atrium and pulmonary veins. The problem with these treatments is that they do not always work, especially long term.

The other approach is to leave the atrium fibrillating and to control the way this affects the overall heartbeat (pulse) which comes from the ventricles. The link between the atrium and the ventricles is through a fuse-like connection known as the "atrioventricular node" or "AV node" and this can be slowed by drugs such as Digoxin or Beta-Blockers (see related AFA Fact Sheets). The problem with this is that the heart rhythm remains irregular and may still be too fast, especially under exercise or stress conditions. Controlling the fast rhythms often causes the slow rhythms to be worse resulting in uncomfortable heavy beats especially at night and occasionally episodes of faintness.

The third way: a Pacemaker

Heartbeats can be artificially induced by a small electrical pulse from electronic devices that are implanted under the skin and connected to the heart by flexible wires. These pacemakers are usually implanted in people whose hearts go too slowly. They can however

be used in Atrial Fibrillation to provide a regular backup rhythm and this may be very helpful for preventing AF in people with a naturally slow heart rate and in smoothing out the rhythm of patients who are in Atrial Fibrillation where the rapid beats have been controlled by drugs. The special benefit however is that once a pacemaker has been implanted the atrioventricular node can be knocked out permanently (destroyed) using a technique known as ablation, leaving the pacemaker to take over the heart rhythm completely to produce a comfortable regular rhythm at the right rate.

What's the downside?

Ablation of the AV node cannot be reversed so people who have undergone this procedure are generally dependent on a pacemaker for the rest of their lives. However, this need not be a major worry as pacemakers are extremely reliable and are very carefully tested and monitored. The pacemakers do need to be checked at least once a year and the batteries do not last forever, but typically for about eight years before the pacemaker needs to be changed. Like all operations pacemaker implants can cause complications, the most serious being infection which may require complete replacement of both the pacemaker and the leads. Overall, the risk of complications is very low, around 5%, and they are hardly ever fatal.

The heartbeats produced by a pacemaker are not quite as efficient as the natural heartbeats but in practice this is only noticeable in people with very weak hearts. More complex (biventricular) pacemakers can be used and these may be even more efficient than the natural heartbeats. A pacemaker will make the heart beat faster on exercise, and more slowly at rest, in the same way as the natural pacemaker but everybody is different and

pacemakers should be carefully adjusted to suit individual requirements – it can take a few attempts to get this just right.

Nearly 100% success guaranteed!

The real advantage of this treatment (Pacemaker and AV Node Ablation) is that unlike any other kind of treatment it usually works. Provided the pacemaker is adjusted properly most people feel back to their old selves with no awareness of their heartbeat, able to enjoy a normal level of exercise and a good night's sleep – with no drug side effects to worry about (apart from Warfarin).

The AV node ablation procedure is relatively simple with almost no complications and a long-term success rate of well over 90%. In those unusual cases where it does not work a second procedure, possibly using a different approach will usually be successful. We have been undertaking this procedure using the same technique since 1990 and so we know there are no long-term problems or late complications, (which is not the case for the newer pulmonary vein ablation treatment).

The place of Pacemaker and Node Ablation treatment

Knowing this treatment is available and will work where other treatments have failed is very reassuring for all those people suffering from Atrial Fibrillation.

After lifestyle changes, especially avoiding alcohol, simple drug treatment should be tried first especially if it maintains a normal heart rhythm without significant side effects. Atrial Fibrillation is often a progressive condition so that drug treatment, though initially successful, may become ineffective after a few years. For the same reason the long-term results from left atrial/pulmonary vein ablation are not known at present. It is likely, especially with the rapid development of the technique, that the failure rate and the complications will be

reduced over the next few years. New drugs are also being developed which may have an important impact on treatment of AF with greater efficacy and fewer side effects than those available up until now.

Apart from the success rate in restoring a regular rhythm there are two important considerations with ablation treatment.

1. Anticoagulation:

Pacing and AV node ablation does not stop the fibrillation from occurring in the atrium and as this is what causes the risk of blood clots so the need for anticoagulation treatment long-term is not affected – i.e. it is required in most cases.

2. Consequences of ablation:

All ablation procedures involve permanent destruction of heart tissues in order to interrupt electrical conduction within it. After AV node ablation a permanent pacemaker is needed to maintain the normal heart rate (although in many cases the heart will beat, however, too slowly, even without a pacemaker).

Conclusion

Ablation of the atrioventricular node requires lifelong permanent pacing and does not reduce the need for long-term anticoagulation. It is therefore mainly used in cases where other methods have proved unsuccessful. However, this treatment is very safe and effective in relieving the symptoms caused by an irregular heart beat or an inappropriate heart rate in people with Atrial Fibrillation. It also has a proven long term efficacy in extensive worldwide experience over more than 10 years.

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