

~~This House believes
that all ICD
candidates should be
offered VT ablation~~

Implantable Defibrillators:

■ The Good

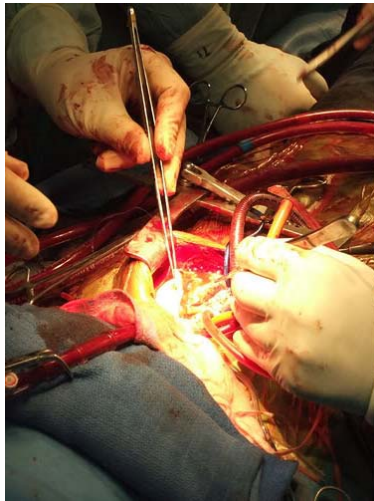
- Improve survival
- Prompt termination of life-threatening arrhythmias
- Antitachy pacing can terminate arrhythmias without symptoms
- Even protect from gunshot wounds!



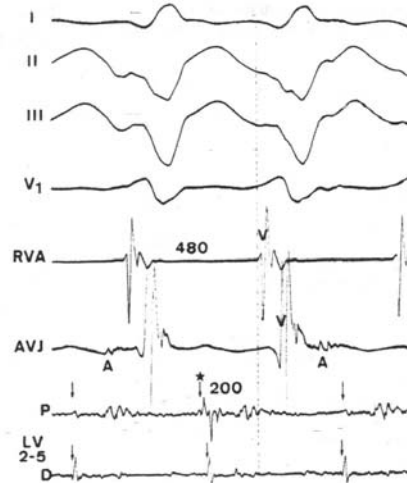
■ The Bad

- Shock therapies painful – impair QOL + psychological dysfunction
- Syncope can still occur prior to termination of life threatening arrhythmias – impact on work, driving, QOL and anxiety
- Inappropriate therapies

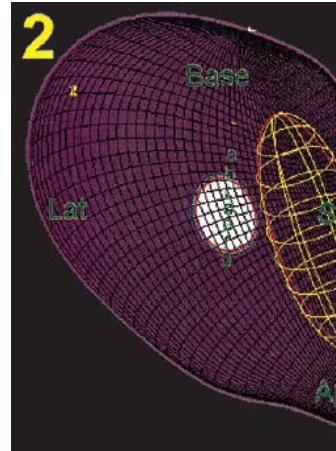
VT Ablation – evolution of techniques:



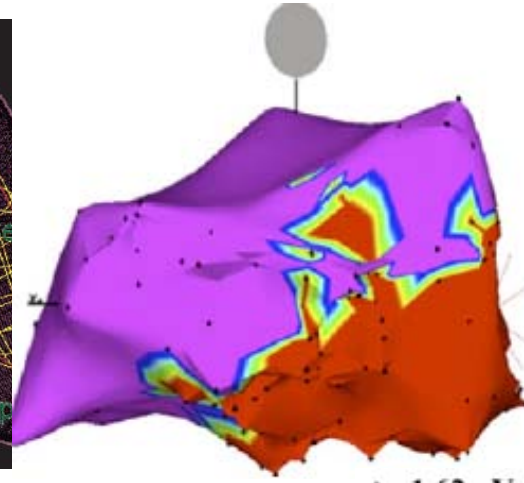
Surgical Ablation – substrate removal +/- mapping of VT



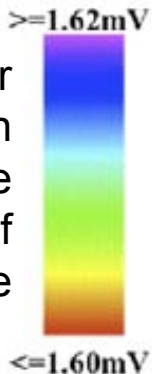
Catheter Ablation with mapping of VT circuit



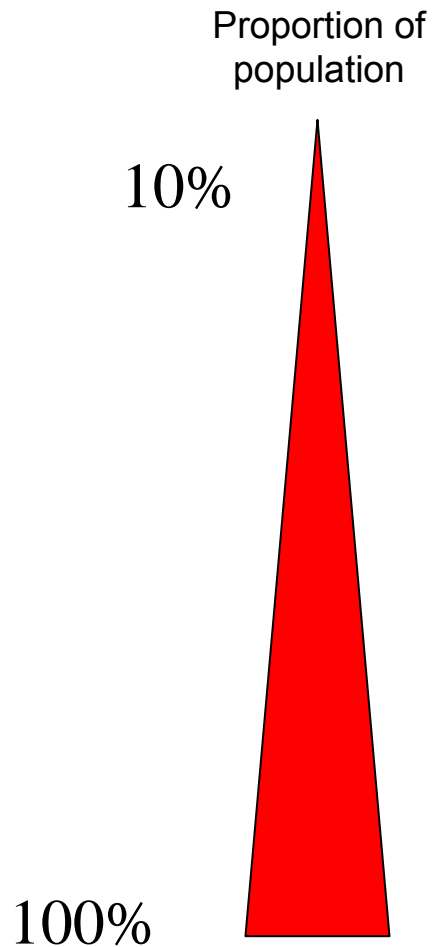
Catheter Ablation with non-contact mapping of VT circuit



Catheter ablation with voltage mapping of substrate



Possible VT ablation strategies in ICD patients:



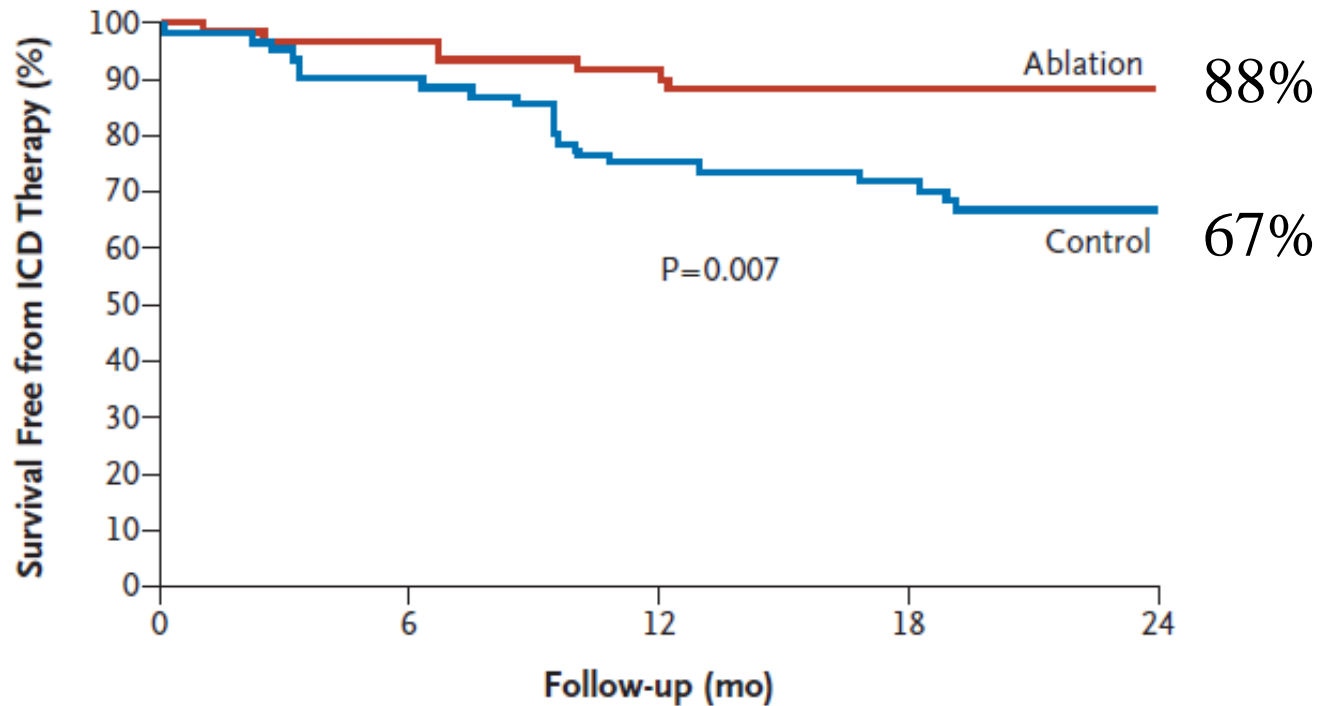
- VT ablation only after VT storm
- VT ablation at 2nd or later arrhythmia recurrence
- VT ablation at 1st arrhythmia recurrence
- VT ablation at time of implant



Can VT ablation at time of ICD implant benefit ICD patients?

- SMASH-VT trial
- N=128
- MI >1/12 prior to enrollment
- All had prior VT (spontaneous or inducible, or VF)
- >90% on beta-blockers. No type I or type III AADs allowed
- 1:1 randomisation to substrate mapped ablation at time of ICD implant vs. conventional treatment

Can VT ablation at time of ICD implant benefit ICD patients?





ALL ICD patients to have VT ablation?

- What we need to know
 - Is therapy applicable to all ICD patients?
 - Long term efficacy – is VT prevented or just delayed?
 - Numbers needed to treat to prevent an ICD therapy?
 - Risk of therapy- numbers needed to harm?
 - Cost of therapy vs. conventional management?

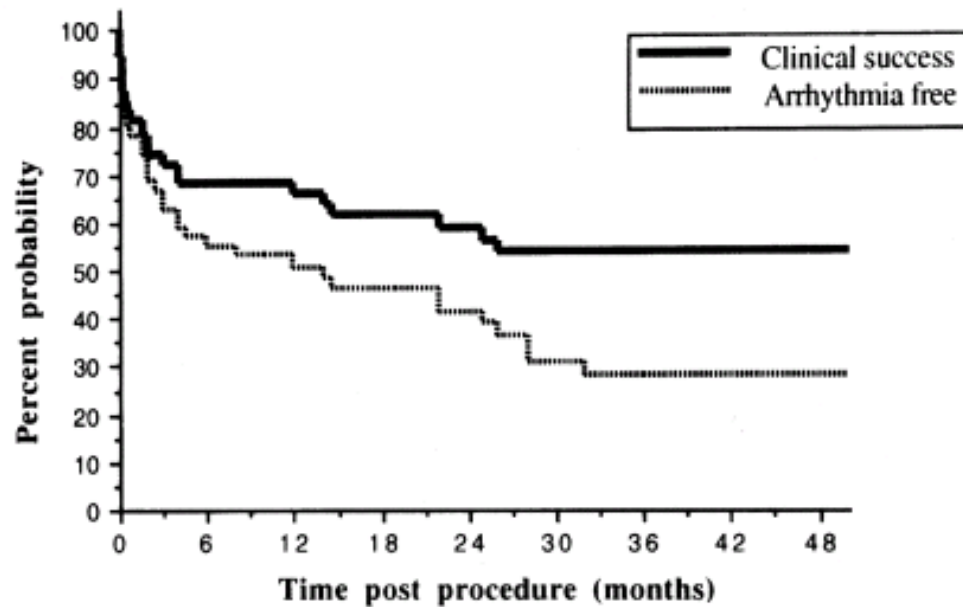


Is the therapy applicable to all ICD patients?

- SMASH-VT was post MI patients only and all had previous arrhythmia
- Primary prevention CAD pts??
- DCM???
- ARVC??
- HOCM???
- LQTS???

No evidence that it is.....

Long-term efficacy of VT ablation:



VTs continue to reoccur more than 2 years after ablation



Numbers needed to treat to prevent ICD shocks with this strategy:

- In SMASH-VT incidence of shock therapy at two years fell from 31% to 9%. VT storms (≥ 3 ICD therapies in 24hrs fell from 19% to 6%)
- Put it another way.....
- To prevent 22 ICD shocks in two years need to do 100 ablation procedures – approx 5 ablations per shock prevented, 8 ablations per VT storm



Risks of ablation:

■ Complications in SMASH-VT:

– N=61 had ablation procedure

- Pericardial effusion without tamponade 1.6%
- Exacerbation of CCF requiring *prolonged* hospitalisation 1.6%
- DVT requiring anticoagulation 1.6%
- Overall non-fatal complication rate ~5%

- Most ablation patients had warfarin anticoagulation for 4-6 weeks after procedure



Risks of ablation:

- Data from Thermocool study
 - 1 death 0.43% -cardiac perforation/tamponade
 - 6 death from uncontrolled VT
 - Heart Failure 2.6%
 - Femoral pseudoaneurysm 1.7%
 - Overall non-fatal complication rate 10.4%



Risks of ablation:

- To prevent two patients receiving an ICD shock you give one patient a non-fatal ablation complication
- To prevent 51 ICD shocks you kill one patient with an ablation complication



Cost of ablation vs. saving from prevented VT storms:

- Cost of VT ablation?
 - Procedure cost - £3k - £10k depending on eqpt.
 - Extra bed stay – likely to be at least 2 days
 - Anticoagulation cost
- Savings
 - VT storm – cost of ablation + 7 days in hospital + psychological trauma.
 - But only for 1/8 of the population
- Unlikely to be cost-effective

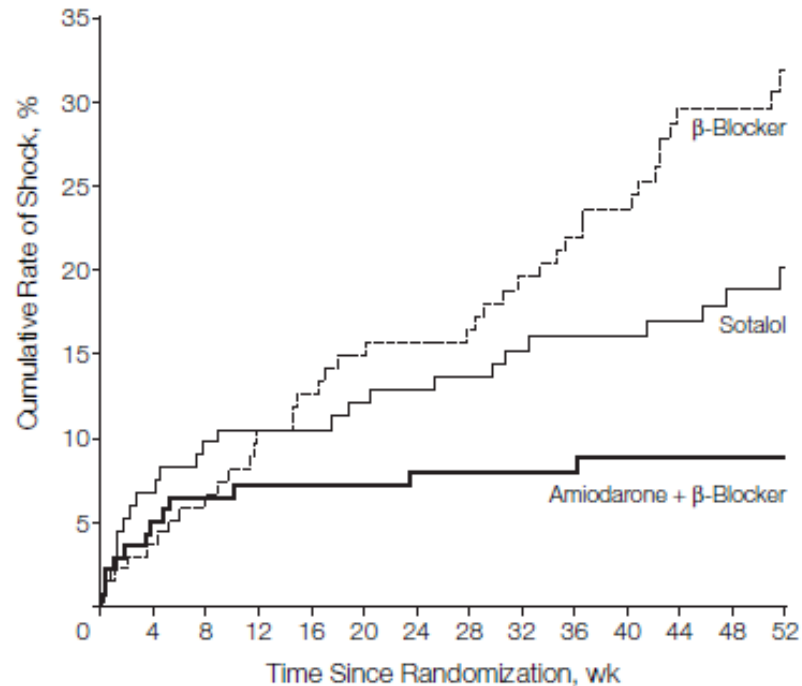


Is it practical??

- Many smaller UK ICD centres do not have facilities for VT ablation
- 2007 – approx 3,100 ICDs implanted in UK
- 2008 434 VT ablations on CCAD database
- 10-fold increase in VT ablation required !

Alternatives to ablation – drug therapy:

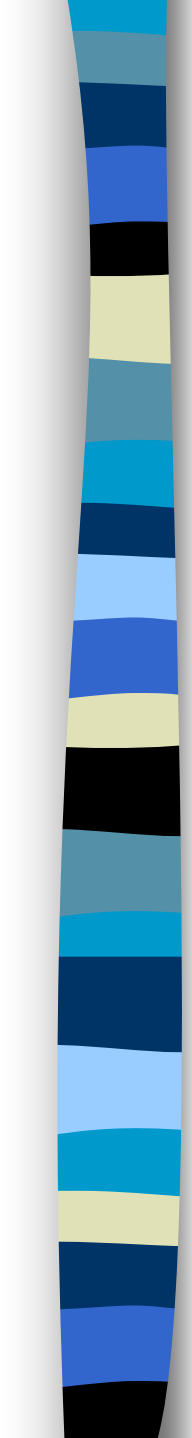
The Optic trial – similar patient to SMASH - VT





VT ABLATION FOR ALL ICD PATIENTS?

- Not all types of ICD patient are suitable for VT ablation
- To prevent one patient receiving an ICD shock therapy 5 patients have to undergo VT ablation at a cost of ~£20k
- For every 2 shock therapies prevented a patient will have a significant procedural complication related to VT ablation and for every ~50 shocks prevented one patient may die as a result of the VT ablation procedure



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