Single sheath lead extraction, a single centre experience with more than 900 lead extractions

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Our centre is serving most of Norway and Iceland for pacemaker and ICD lead extractions. We have adopted a single sheath technique, a variant of the diatitating sheath technique described by Byrd.

From 1998 to end of August 2010, we have treated 551 patients, median age 64 years (range 7-95 years), with 904 leads. Fifty-one percent of the extractions were performed on infections, the rest were elective. Median age of all leads was 5 years (range 0.1 to 42 years). The single sheath technique was used in 69 % of the extractions, in 26 % we used traction alone, in 5% various fishing techniques and in 1% “Evolution” (Cook).

Stepwise lead extraction

The leads are disconnected from the generator and dissected free as far as possible to the vein entrance and we try to obtain a straight angle to the vein. Standard styles are inserted into the leads (if possible) and gentle traction is applied with concomitant fluoroscopy.

We start with a gentle traction, and then proceed to the single sheath technique, after applying a locking wire (Cook/Spectranetics/VascoMed). A single Cook polypropylene sheath is mounted with a Cook Pin Vise and is gently pushed down the lead with rapid rotation. We start with a small calibre (more flexible, better torque strength) and increase calibre if we meet serious resistance. For larger body leads (ICD) we have also used “VisioSheath” (Spectranetics). In some patients a steel sheath is used to access the subclavian vein. Free-floating leads, and leads where extraction via subclavia is impossible, are extracted with a variety of snares (“Goose-neck, basket, “Needles eye”), preferably from the right jugular vein.

Results

Complete success has been achieved in 96 %. Partial success (ie. removal of all of the lead except the distal 4 cm) has been achieved in 3 % of the lead extractions. The overall clinical success is 99 %.

ICD-leads: 154 leads: 99 % success, one major complication, resolved without sequela. Median “sheath-time” (ie. the time the sheath is applied) is 5 min., range 1 to 300 minutes.

Complications: Major complications 2 %, one procedural death, one SCD one week after the procedure. Minor complications 1 %.

Conclusions

The single sheath technique is effective with 99 % clinical success. The technique appears to be a quick and effective (and cheap) alternative to laser sheath lead extraction. The complication rate of the single sheath technique is low.

The different types of complications. * One other patient was downgraded from ICD to PM, and died from VF one week later (witnessed).