

Tapered Doppler Shunt Prevents Two Cerebral Emboli

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With the use of any carotid shunt flow should be monitored. The inclusion of a small Doppler crystal in the shunt wall is a simple, cost effective design and does not hamper the performance of the shunt.

We have used a plain, straight, #10, inlying shunt on all carotid endarterectomies. Three years ago we began the use of a new tapered shunt with a Doppler feature, which provided real time verification of blood flow. During a routine case we needed to move the proximal tourniquet to remove more atheroma. After replacing the tourniquet the case was uneventful until the Doppler sound stopped while closing the arteriotomy. The volume of Doppler sound started to decrease and after about 30 seconds, there was no sound being produced by the transceiver. The shunt was removed and placed on the back table. Examination of the shunt after the completion of the case revealed a piece of calcified plaque stuck inside the shunt, 4 cm from the distal tip. Without the Doppler feature, we would not have been aware of the sudden cessation of blood flow. The tapered shunt allowed the plaque to enter, but the smaller distal end kept it from exiting. With this experience we have used this shunt exclusively.

The shunt's outer diameter sizes are tapered from 12 French to 9 French with blood flows that exceed a straight 10 French shunt. The taper provides an additional safety feature as evidenced by this report.

One year later, again during a routine carotid endarterectomy, the same course of events occurred. The Doppler monitor indicated a drop in volume, followed by complete cessation of the signal. Upon examination, the plaque found within the tapered shunt was

photographed. *see picture. EEG monitoring was used during both cases and no changes were recorded.



When this was reported to the company, we were informed of four reports of similar experiences by other groups, who were using the tapered shunt with Doppler. A weakening signal followed by complete cessation of sound is precisely how the system is designed to function. Fluctuations in flow related to blood pressure and heart rate have a direct relationship to the pace of the audible signal being produced by the Doppler transceiver. In our opinion this makes a strong case for the use of tapered shunts with Doppler monitoring.