



## TEE-GUIDED VERSUS TEE-CONTROLLED PFO CLOSURE: SINGLE CENTER REGISTRY

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### **Background:**

Percutaneous closure of patent foramen ovale (PFO) is conventionally performed under continuous transesophageal echocardiographic (TEE) guidance. Whilst this is considered to increase safety and accuracy, it can also have an impact on procedural consequences, such as longer duration, patient sedation or anesthesia, more personal and patient discomfort.

We aimed to evaluate whether a simplified procedural approach, including pure fluoroscopy-guidance and only final TEE control, as well as an aimed 'next-day-discharge' is comparable with the conventional TEE-guided procedure in terms of periprocedural and long-term outcomes.

### **Methods:**

All patients who underwent a PFO closure in our department between 2010 and 2021 were retrospectively included. Prior to June 2019 cases were performed with continuous TEE guidance (*TEE-guided group*). Since June 2019 pure fluoroscopy-guided PFO closures have been performed with TEE insertion and control just prior to device release (*TEE-controlled group*). In total 265 patients were included in the analysis: 197 in the *TEE-guided group* and 68 in the *TEE-controlled group*. We analyzed procedural aspects, as well as long term clinical and echocardiographic outcomes.

### **Results:**

Anatomy was similar in both groups regarding channel length ( $11\pm 4\text{mm}$  vs  $10\pm 4\text{mm}$ , respectively;  $p=0.65$ ) and separation ( $4\pm 2\text{mm}$  vs  $4\pm 1\text{mm}$ ;  $p=0.36$ ). Cross-over from TEE-control to TEE-guidance group occurred in 9% due to difficulties with PFO crossing. In 3 cases (4%) device recapture was needed due to inappropriate position at TEE-control. TEE-controlled procedures took markedly less time ( $29\pm 9$  vs  $48\pm 20\text{mins}$ , respectively;  $p<0.01$ ; Figure) and performed with smaller devices (left disk diameter  $18\pm 2\text{mm}$  vs  $26\pm 3\text{mm}$ ;  $p<0.01$ ). There was no difference in procedural complications, such as access site bleeding (1.5% vs 5.6%, respectively;  $p=0.30$ ) or periprocedural TIA/Stroke (0% vs 1.5%, respectively;  $p=0.58$ ). Hospital



stay was markedly shorter with the simplified approach ( $3\pm 1$  vs  $4\pm 1$ mins, respectively;  $p<0.01$ ) with more same- or next-day discharges (30.3% vs 9.6%, respectively;  $p<0.01$ ).

At  $6\pm 3$  months echocardiographic follow-up a residual leakage was described in 11% of the TEE-guided cases and 2% of the TEE-controlled cases ( $p=0.02$ ).

Median follow-up was longer for TEE-guided patients (33 [7;63] vs 6 [0;7] months, respectively;  $p<0.01$ ). With this respect, there were no differences in thromboembolic events (4.6% vs 0%, respectively;  $p=0.13$ ). Atrial fibrillation (7.1% vs 0%, respectively;  $p=0.02$ ) and patient-oriented cardiac events (8.6% vs 0%, respectively;  $p<0.01$ ) occurred more often in the TEE-guided group, however at later follow-up (22 [9;56] months and 25 [10;60] months, respectively).

### **Conclusion:**

While a complete TEE-free PFO closure might have potential procedural risks, a pure TEE-controlled approach seems to be advantageous in terms of procedural aspects with no sign of any acute or long-term hazard.

### **Figure:**

