

EP-143

미세혈관 유방 재건술에서 동맥 Coupler 사용을 위한 알고리즘적 접근: 수기 봉합과의 비교

An Algorithmic Approach to Arterial Coupler Use in Microsurgical Breast Reconstruction: Comparison with Hand-Sewn Sutures



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Purpose: Microsurgical breast reconstruction offers superior outcomes after mastectomy, but vascular micro-anastomosis remains technically demanding. Venous couplers are widely adopted, whereas the use of arterial couplers remains controversial. This study aimed to establish an algorithmic approach for arterial coupler use and compare outcomes with hand-sewn sutures

Methods: A retrospective review was performed on 105 patients undergoing deep inferior epigastric perforator flap breast reconstruction by a single surgeon. Patients were divided into an arterial coupler group (N=62) and a hand-sewn suture group (N=43). An intraoperative algorithm guided coupler use, requiring the absence of atherosclerosis, intact intima, and adequate vessel laxity. Demographics, operative details, micro-anastomosis time, and postoperative outcomes were analyzed.

Results : Patients in the coupler group were younger (47.6±8.6 vs. 53.0±7.9 years, p=0.001) and underwent more robot assisted procedures (16.1% vs. 2.3%, p=0.025). Micro-anastomosis time was significantly shorter with couplers (19.6±8.9 vs.26.1±6.5 minutes, p<0.01). Flap survival was comparable between groups (96.8% vs. 100%, p=0.512). Complication rates, including arterial/venous insufficiency, hematoma, and infection, showed no significant differences. Two coupler failures occurred: One venous congestion and one late thrombosis, both attributed to multifactorial causes rather than device failure.

Conclusions: Arterial couplers, when used under strict algorithmic selection criteria, provide reliable outcomes comparable to hand-sewn sutures while significantly reducing operative time. This approach enhances efficiency in microsurgical breast reconstruction and may guide future standardized practice.

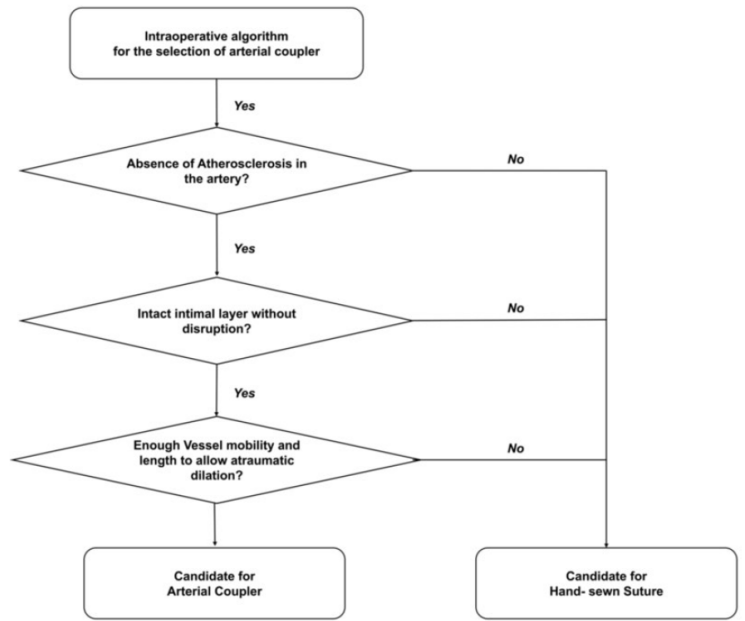


Fig. 1. The intraoperative algorithm for selection of the arterial coupler.

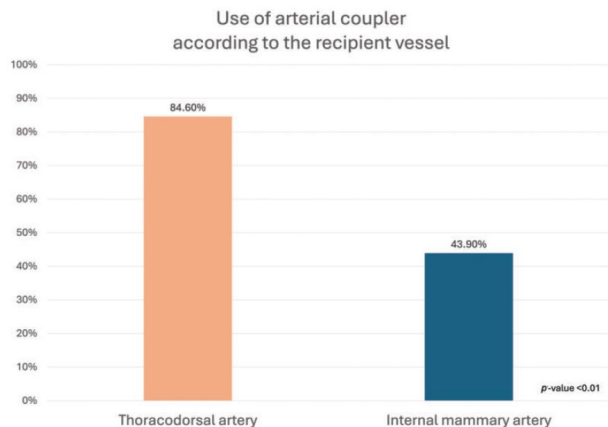


Fig. 2. The use of arterial coupler according to the recipient vessel.

Table 1. Reconstructive outcomes

Variable	Arterial coupler (N = 62)	Arterial hand-sewn (N = 43)	p-value
Revisional surgery	4 (6.5%)	3 (7.0%)	1.0
Arterial insufficiency	2 (3.2%)	0 (0.0%)	
Venous insufficiency	2 (3.2%)	1 (2.3%)	
Others	0 (0.0%)	2 (4.7%)	
Flap survival	60 (96.8%)	43 (100.0%)	0.512
Hematoma (Breast)	1 (1.6%)	4 (9.3%)	0.156
Infection	1 (1.6%)	0 (0.0%)	1.0
Seroma (breast)	1 (1.6%)	1 (2.3%)	1.0