

PP-03

슈반세포종의 적출 가능성 스펙트럼: 신경 절제를 결정짓는 임상적 및 형태학적 요인에 대한 고찰

(The Spectrum of Enucleability in Schwannomas:
A Reflection on Clinical and Morphological Factors
Mandating Nerve Resection)



동국대학교 일산병원
성형외과

김경현 임수아 조상현 어수락*

Purpose:

While peripheral schwannomas are theoretically ideal for nerve-sparing enucleation, clinical challenges often necessitate segmental resection. This study aims to bridge the gap between theory and surgical reality by analyzing how nerve sheath anatomy transitions in distal branches influence dissection feasibility. We specifically investigate whether the loss of the "epineurial buffer" in paucifascicular nerves dictates enucleation failure, despite a benign pathological diagnosis.

Methods:

We retrospectively reviewed 27 pathologically confirmed schwannoma cases, categorized into the Preservation Group (n=18) and the Resection Group (n=7). We compared tumor size, anatomical location, and intraoperative morphology (hammock-like vs. onionskin-like) to identify predictors of nerve sacrifice.

Results:

Segmental resection was required in 25.9% (7/27) of cases. Paradoxically, the Resection Group exhibited a smaller mean tumor size (1.38 cm) than the Preservation Group (2.17 cm), suggesting that tumor volume is not the primary predictor of surgical outcome. Resections were predominantly concentrated in distal peripheral nerves, such as digital nerves, where 85.7% of cases demonstrated an "onionskin-like" morphology that precluded safe dissection.

Conclusion:

Our findings suggest that nerve preservation is critically dependent on the presence of an epineurial buffer, which diminishes significantly as nerves branch distally into paucifascicular structures. In terminal branches, the anatomical thinning of the epineurium

and the lack of interfascicular space lead to circumferential fascicular involvement, rendering enucleation technically impossible regardless of tumor size.

Therefore, surgeons must move beyond the traditional "enucleation-only" mindset; when managing suspected schwannomas in distal nerve branches, meticulous preoperative counseling regarding the high probability of segmental resection and subsequent reconstructive planning is essential.



Fig. 1. Preoperative gross photography



Fig. 2. Intraoperative gross photography

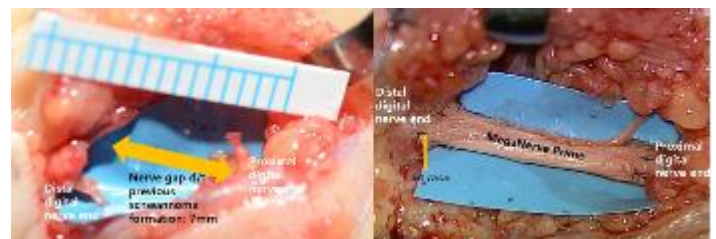


Fig. 3. Intraoperative gross photography, nerve graft

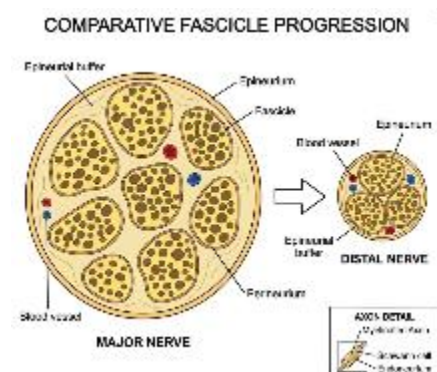


Fig. 4. Microanatomy of the nerve illustrating the epineurium, perineurium, endoneurium, and fascicles