

Background:

Recent discoveries regarding the glymphatic and meningeal lymphatic systems have highlighted their critical role in clearing metabolic waste products—specifically amyloid-beta and tau proteins—from the central nervous system. Impaired lymphatic drainage through the deep cervical lymph nodes (dCLNs) is increasingly recognized as a key contributor to the pathogenesis and progression of Alzheimer's disease (AD). Supermicrosurgical deep cervical lymphaticovenous anastomosis (dcLVA) has emerged as a novel, mechanism-driven structural intervention designed to bypass these lymphatic outflow obstructions and enhance cranial clearance. This study presents our preliminary experience evaluating the safety and technical feasibility of neck LVA in patients with AD at Kaohsiung Chang Gung Memorial Hospital (KCGMH).

Methods:

A prospective series of three patients with confirmed diagnoses of Alzheimer's disease underwent bilateral cervical supermicrosurgical LVA. Indocyanine green (ICG) lymphography was utilized intraoperatively to map the cervical lymphatic anatomy and identify functional lymph channels. Under high-power magnification, supermicrosurgical anastomoses were performed to connect the identified cervical lymphatic vessels directly to adjacent small recipient veins. Perioperative safety profiles, technical execution parameters, and early postoperative cognitive and functional outcomes (assessed via [e.g., MMSE]) were documented at a follow-up interval of [e.g., 1, 3, 6, and 12] months.

Results:

Bilateral neck LVA was successfully executed in all three cases without intraoperative technical failure. Either cervical lymphaticovenous anastomoses or Split LN-vein end-to-side anastomoses were performed. No serious adverse events (SAEs), such as severe hematoma, deep neck infection, or permanent neurological deficits, were observed in the immediate post-operative period. Early follow-up assessments revealed improvements in some motor function in all 3 patients].

Conclusion:

Our early, three-case experience at KCGMH demonstrates that deep cervical LVA is a technically feasible and safe supermicrosurgical intervention for patients with Alzheimer's disease. While these preliminary data show promising perioperative safety and initial functional stability, longer longitudinal tracking and rigorous, larger-scale controlled clinical trials are required to establish the sustained efficacy of dcLVA on cognitive decline.