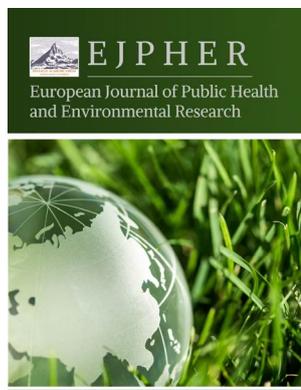




Review **Open Access**

Research on the Operational Techniques and Thread Development Status of Acupoint Catgut Embedding

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1. Introduction

Acupoint catgut embedding therapy is an innovative treatment that integrates the traditional acupuncture concept of "deep insertion and prolonged retention" with modern material science. By implanting absorbable threads into acupoints, it provides continuous physical and biochemical stimulation during in vivo degradation, thereby achieving long-term regulation of meridians and Qi-blood. Since its clinical introduction in the latter half of the 20th century, the technique has evolved from using natural catgut to various synthetic absorbable sutures. In 2019, the China Association of Acupuncture-Moxibustion issued the group standard *Technical Operation Standard for Acupoint Catgut Embedding* (T/CAAM 013-2019), establishing a systematic framework for standardized practice. This review aims to summarize the key operational techniques, material development, and clinical application status of acupoint catgut embedding.

2. Methods

This review is based on published clinical studies, technical specifications, and material science literature retrieved from databases such as CNKI and PubMed. The inclusion criteria focused on randomized controlled trials, systematic reviews, technical standards, and comparative studies on thread materials. Content analysis was applied to synthesize information on operational standardization, thread performance, clinical indications, and typical case studies.

3. Results

- 1) **Standardization of Operational Techniques:** Standardized procedures include preoperative preparation and assessment, precise needle insertion and thread placement, and postoperative management. Key technical points emphasize stable needle handling, accurate acupoint localization, and appropriate insertion depth. The catheter needle method is widely adopted. Postoperative care involves pressure on the needle hole and avoidance of local wetness for 24 hours. Common adverse reactions such as hematoma and induration are generally mild and self-limiting.
- 2) **Evolution of Thread Materials:** Thread materials have progressed from natural catgut (first-generation) to synthetic absorbable materials such as PGA, PLA, and PGLA (second-generation), and further to long-acting synthetic materials

like PDO (third-generation). Synthetic threads degrade via hydrolysis, offering more predictable absorption rates, improved biocompatibility, and minimal allergic risk. PDO threads, with a degradation period of approximately 180 days, are particularly suitable for chronic conditions requiring sustained stimulation.

- 3) **Clinical Application Status:** Indications have expanded from pain management to systemic conditions including simple obesity, chronic musculoskeletal disorders, functional gastrointestinal diseases, and chronic urticaria. Clinical evidence supports the efficacy of thread embedding, especially when combined with TCM pattern differentiation. Case examples demonstrate successful outcomes using PGLA for obesity, PDO for chronic low back pain, and PGA for urticaria, reflecting tailored material selection based on disease duration and treatment goals.

4. Discussion

The current practice of acupoint catgut embedding benefits from a standardized operational framework and advanced material options. Its strength lies in merging acupuncture therapy with modern biomaterials, enabling prolonged stimulation and reduced treatment frequency. However, limitations persist: many clinical studies have small sample sizes, insufficient follow-up, and lack of rigorous blinding. The mechanisms underlying thread degradation and local immunological interactions remain underexplored at the molecular level. Future efforts should focus on high-quality multicenter trials, interdisciplinary research on material-tissue interactions, and enhanced training to promote consistent technical application across healthcare settings.

5. Conclusion

Acupoint catgut embedding has developed from an empirical technique into a standardized TCM therapy with diversified material options. The adoption of long-acting synthetic threads, especially PDO, marks a shift toward sustained and mild stimulation. Current evidence supports its value as an adjunct treatment for conditions such as obesity and chronic pain. Moving forward, prioritizing evidence-based research, mechanistic studies, and standardized training will be essential to advance this integrative therapy toward broader and more precise clinical application.

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