



倒鉤縫線術前腫瘤精準定位技術

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簡歷： <https://ntu-biomedical-polymer.weebly.com/about.html>

市場及需求：

根據 BCC Research 研究資料顯示，2014 年全球微創手術的市場規模約為 15.4 億美元，到 2019 年會達到 21.5 億美元，2014 至 2019 年的年複合成長率達到 6.8%。目前微創手術已廣泛運用在各領域手術中，因此更需要發展能夠輔助微創手術的精確定位技術。未來可與醫材公司合作，將技術商品化，實際運用在臨床的手術操作，非常具有市場潛力。

技術摘要(含成果)：

本技術為將臨床已使用之手術倒鉤縫線，加以設計後結合注射針筒使用，透過 CT 影像技術得輔助，將縫線注射進器官標定出需切除之組織，手術線頭具有特殊圓錐設計，能夠精確標定腫瘤位置，而縫線上的倒鉤則能與周圍組織作用，防止縫線滑脫。另外縫線可塗層不同類之顯影劑，有助於進一步之腫瘤位置判讀。

優勢：

現今微創手術技術發達，因此需要一種更精確、侵入性傷害更小的術前腫瘤定位技術作為輔助。此種技術除了能夠精準標定出器官內腫瘤位置，還可降低標定過程對周圍組織之傷害，並且透過縫線倒鉤的設計，防止縫線因患者移動而滑脫所產生之標定誤差。簡易的注射操作方式也可降低手術過程中醫師的不便，也能在注射筒內填充其他生物膠等溶液，協助傷口之癒合。縫線表面塗層不同種類的顯影劑，可進一步協助醫師在術前能精確判讀腫瘤之位置。

競爭產品：

目前在臨床的腫瘤定位手術上，多使用電腦斷層導引穿刺定位，將長針刺入腫瘤位置，並且注射甲基藍以供腫瘤定位，但甲基藍等染劑會隨著時間和患者身體的移動而產生擴散等情況，造成標定不精確的問題，病人在切除手術前的等待期間，也必須忍受長針留在身上造成的不便和恐懼。這幾點原因都會導致定位手術和切除手術之間的時間被限制。而透過此定位技術。以縫線代替長針和染劑作為標定工具，可解決定位不精確以及患者不適和恐懼感等，並有效延長手術間隔時間。

專利現況：

本研究團隊具有多年開發生醫材料之經驗，目前正在申請中華民國專利，本實驗室主持人近年來更積極從事專利發表與產學合作，相信未來會有更好的成果應用在生醫材料領域。

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Barbed suture for pre-operative tumor localizing technology

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Market Needs:

According to BCC Research, the global Minimally invasive surgery market is estimated to be approximately US\$15.4 billion in 2014, It is expected to reach 21.5 billion US dollars by 2019, and the compound annual growth rate from 2014 to 2019 reached 6.8%. Currently, minimally invasive surgery has widely used in various fields of surgery. Therefore, it is more necessary to develop accurate localizing technology that can assist minimally invasive surgery. In the future, we can cooperate with medical device companies to commercialize this technology. It will have the opportunity to develop great market potential.

Our Technology:

This technology combined an injectable syringe with the suture which is applied on clinical surgery. We localize the tumor site by injecting barbed suture into the organ. The suture thread head has a special conical design, which can precisely mark the tumor site. The barbs on the suture can interact with the surrounding tissue to prevent the suture from slipping. In addition, the suture can be coated with different types of contrast agents, which is helpful for further tumor location interpretation.

Strength:

Currently, minimally invasive surgery technology has already applied widely in clinical field. Therefore, a more accurate and less invasive pre-operative tumor localization technology is needed as an aid. In addition to accurately localizing the tumor site in the organ, this technology can also reduce the damage to the surrounding tissue during the localizing process. The design of the suture barbs prevents the localizing error caused by the suture slipping due to patient's movement. The simple operation method of injection can also reduce the inconvenience of the doctor during the operation, and we can also fill the syringe with other solutions such as bio adhesion to assist the healing of the wound. The surface of the suture can be coated with different types of contrast agents, which can further help the doctors to accurately determine the location of the tumor site before surgery.

Competing Products:

Currently, CT-guided preoperative localization usually uses hook wires or as the marking materials. Doctor inserts hook wires or needles into the tumor site and inject methyl blue for tumor localization. However, dyes such as methyl blue will spread all over patient's body, resulting in inaccurate localization. Patients must also endure the inconvenience and fear caused by hook wires or needles left on the body while waiting before the resection surgery. For these reasons, the time interval between localization surgery and resection surgery is limited. By using this localization technology. The use of sutures instead of hook wires and dyes as a localizing tool can solve inaccurate localization and patient's discomfort. This technology can also extend the time interval between two sugery effectively.

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