Design Postprint of an Adjustable-Angle Auricular Point Probe

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Abstract

An ear acupoint probe with adjustable probe angle is designed to facilitate more accurate detection of positive points at special areas of the auricle. The probe consists of a handle, a connecting rod, and a probe tip, and is characterized in that: a first angle adjustment device is provided at the connection between the handle and the connecting rod, and a second angle adjustment device is provided at the connection end between the connecting rod and the probe tip. This probe facilitates operators in locating acupoints at special areas of the auricle and is more conducive to saving effort for the operator. The probe is convenient to operate, is suitable for various patients, has good prospects for clinical application, and is worthy of promotion and use.

Full Text

Design of an Auricular Acupoint Probe with Adjustable Probe Angle

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Abstract

This paper describes the design of an auricular acupoint probe with an adjustable probe angle to facilitate more accurate detection of positive reaction points in special regions of the auricle. The probe consists of a handheld handle, a connecting rod, and a probe tip. Its key features include a primary angle-adjusting mechanism at the junction between the handle and connecting rod, and a secondary angle-adjusting mechanism at the junction between the connecting rod and probe tip. This design enables operators to locate acupoints more easily in specialized auricular regions while reducing physical strain. The probe is convenient to operate and suitable for various patients, demonstrating promising clinical application potential and warranting broader adoption.

Keywords: auricular acupoint treatment; probe rod; adjusting device

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Introduction

According to the *Lingshu · Kouwen* text, "the ear is where all the ancestral vessels converge." Traditional Chinese medicine holds that the viscera, bowels, and meridians of the human body all have corresponding acupoints on the ear. Auricular acupoints, distributed across the auricle, maintain close connections with the twelve meridians, internal organs, and nervous system through interlinking channels. By stimulating these corresponding points, practitioners can balance yin and yang, regulate organ function, promote qi and blood circulation, prevent disease, and alleviate symptoms. The auricular probe rod is used to locate positive reaction points in these corresponding acupoints by exploring sensitive spots within a specific acupoint region or between adjacent acupoints.

Most existing auricular probes employ a straight rod design. However, during auricular therapy, certain regions of the ear are located on the medial surface of the auricle or within concave areas that are difficult to access with a straight probe. Inaccurate positioning directly compromises therapeutic efficacy. If the probe angle could be adjusted, operations would become more convenient while achieving more precise point location. Therefore, there is a clear need for an auricular acupoint probe with adjustable angles to facilitate accurate point location in specialized auricular regions while reducing operator exertion.

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1. Materials and Construction

The adjustable-angle auricular acupoint probe comprises a handheld handle, connecting rod, and probe tip. The handle connects to the connecting rod, which terminates in the probe tip. A primary angle-adjusting device is installed at the handle-connecting rod junction, while a secondary angle-adjusting device is positioned at the connecting rod-probe tip junction.

The primary angle-adjusting mechanism consists of an arc-shaped housing at the lower end of the handle, with a fixed shaft at its center. The upper portion of the connecting rod features a shaft hole that engages with the fixed shaft, enabling the connecting rod to rotate around this axis. An automatic locking mechanism within the arc-shaped housing restricts the rod's rotation. This locking mechanism comprises an elastic clamping plate on the inner wall of the housing, featuring two or more linear grooves radiating outward from the fixed shaft's center. The concave curvature of these grooves matches or exceeds the outer curvature of the connecting rod, ensuring secure positioning.

The secondary angle-adjusting mechanism utilizes a malleable silver material that can be repeatedly and easily bent manually. This material may constitute either the entire connecting rod or only its distal portion.

[Figure 1: see original paper] Schematic diagram of the auricular acupoint probe with adjustable probe angle structure

[Figure 2: see original paper] Internal view of the angle-adjusting mechanism at different angles

The probe features a two-stage angle adjustment system. The first stage, located between the handle and connecting rod, allows large-angle adjustments up to 90°, accommodating broad positioning based on patient anatomy or operator preference. The second stage, situated at the probe's anterior segment, permits more nuanced and flexible angle modifications that facilitate precise localization and enhance therapeutic outcomes.

Key innovations of this device include the primary adjustment mechanism, which promotes energy-efficient operation, and the overall design that enables accurate detection of positive points in specialized auricular locations.

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3. Discussion

In recent years, as traditional Chinese medicine techniques have gained wider acceptance, external treatment modalities have demonstrated distinct advantages. Auricular therapy has proven particularly effective for treating pain, insomnia, and other conditions, offering a valuable alternative to pharmacological interventions while reducing adverse effects. Precise auricular point localization is essential for subsequent therapeutic success. However, conventional straight probes present limitations in locating points in specialized regions, compromising both operational convenience and ergonomic efficiency. Inaccurate positioning directly affects treatment outcomes, while operational difficulties can negatively impact patient experience.

The adjustable auricular probe addresses these challenges through its two-stage angle adjustment system, enabling precise point location in specialized regions. This innovation enhances therapeutic efficacy and improves patient experience,

thereby promoting the broader adoption of auricular therapy as a traditional Chinese medicine practice. Additionally, the design facilitates more convenient and energy-efficient operation for practitioners, conserving medical resources while strengthening patient trust in the operator.

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Conflict of Interest Statement: The authors declare no conflict of interest.

Note: Figure translations are in progress. See original paper for figures.