Ninety-seven Cases of Perforation of Ear Drum Repaired by
Prick-acupuncture Using Needle in Combination with MEBO Paster

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For patients with refractory chronic perforation of ear drum, operation to recuperate the integrity of ear drum is necessary in order to improve their audition and prevent the infection of middle ears. Ninety-seven cases (108 ears) of perforation of ear drum have been treated in our hospital using the combined puncturing with sharp needles and MEBO paster method since 1998 and the results were satisfactory. The details are as follows.

Clinical Data: There were 97 cases (108 ears) in this group. Among them, 61 cases (70 ears) underwent chronic simple tympanitis and 36 cases (38 ears) suffered from traumatic perforation of ear drum. Fifty-six cases were male and 41 were female. Their average age was 31.5 and course of diseases was from 1 month to 20 years. All cases were perforation of pars tensa of tymbale and all cases had survival ear drum remained at the edge of the perforations. The size of the perforation was measured by the operation microscope with scale and 51 ears were with large-sized perforations (> 315mm), 35 ears were with middle-sized perforations (215~315mm) and 22 ears were with small-sized perforations (< 215mm). Through CT scanning or X-ray examination of temporal bones, the cases of tympanitis were not caries tympanitis and through ear-clysis, the functions of their auditory tubes were normal. In pure tone screening, the average loss of auditory threshold of air conduction (015kHz, 1kHz, 2kHz) among all the cases was (3513 ± 518) dBHL and the average air-bone gap was (2614 ± 515) dBHL.

The Therapeutic Method: Disinfected the external auditory canals with 0105% complex iodine. Applied Bonain’s cotton pieces onto the survival ear drum remained surrounding the edge of the perforation to anesthetize for 10min, and then took the sticking pieces out. Under the operation microscope, multipointly punctured the epithelial layer of ear drum with sharp needles along the edge of the perforation and pick out the healing circle. Penetrated the perforation through the new wound margin with 1 mm angle needles. Uncovered the epithelial layer of tympanic membrane at 1 mm beyond the edge of perforation until the fibrous layer was exposed and blood-oozing wound was formed. The ready-for-use sterilized paster was used to cover the newly picked and punctured wound with the size of slightly larger than the wound and a layer of MEBO (Developed and produced by Beijing Guangming TCM Institute of Burns Wounds & Surface Ulcers. Elements: β-sitosterol, baicalin and berberine) was smeared onto the sheared paster, and then was sticke onto the perforation. Asepsis tampons was placed into the external auditory canal to prevent contamination. Prohibited Valsalva’s maneuver after operation. Took out the sticking pieces every 1~2 weeks to exam the
granulation condition of the wound. If the wound did not heal, punctured it with needles again to make it ooze new blood and applied MEBO paster onto it until it heals.

**Result:** Among the 97 cases (108 ears), the ear drum of 106 ears healed with full thickness. The ear drums on healing positions were as thick as those on normal positions and did not remain obvious trace. Two ears of tympanitis with big perforations of ear drum (diameter > 5 mm) did not heal after five times’ of ear drum replacement, so received reparation of temporal muscle in hospital. For cases treated with combined acupuncture - MEBO paster, none suffered form infection of wound in ear drum, and the healing time of perforations of ear drum were 7~84 days, averagely 35 days. Thirty-six ears healed through 1~2 times of needle puncturing and replacements, 51 ears healed through 3~4 times, 19 ears healed through 5~6 times and the average time of replacement was 311. After treatments, the average air conduction auditory threshold improved $(2315 \pm 415)$ dBHL, which markedly differed from that before treatment ($P < 0.0101$). This group was followed up for 6~8 month, the shapes of their ear drum and their audition retained good conditions post healed. Besides, only one case of tympanitis recurred in 1 year post operation and the ear drum was perforated again. The perforation of this case healed through antiphlogistic treatment and replacement again.

**Discussion:** The reason for refractory chronic perforation of ear drum is that: after perforation, the tissue cells in different layers of ear drum grow at different speed. Namely, epidermal cells in external layer grow at higher speed and cross the edge of perforation to connect with epithelium mucosal in internal layer that resists the healing of perforation (Yi Xing, Wang Jibao and Liu Shiying *The Clinical Study on Epidermal Growth Factors in Promoting the Healing of Ear drum, The Journal of Clinical ENT Department*, 1996; 1010 (4) : 211—212). In this group, 106 cases of the perforations of the total 108 ears were healed by MEBO paster. The achievement ratio was 98.11%. The main reason of the failure of 2 cases was concerned with the large size of the perforations, the calcification, withering and the poor blood circulation of survival ear drum. Besides, the recurrence of tympanitis during the course of reparation was another reason. The combined acupuncture - MEBO non-woven fabric paster in repairing perforation of ear drum processes had the following advantages: (1) Out patient clinic treatment will not affect the patients’ normal work and cost less. (2) Acupuncture stimulation therapy is superior to chemical calor. It has been proved that chemical calor using trichloroacetic acid impacts the healing of ear drum and comparing with acupuncture stimulation therapy, it has the disadvantages of longer healing time, more stimulation time and slower regeneration (Ni Guansen, *The Burn Therapy of Trichloroacetic Acid Impacts the Healing of Ear drum, The Academic Reports of Shanghai Second Medical College*, 1999 ;19 (2) : 144—146 ). Comparatively, mechanical stimulation is an ideal therapy. (3) MEBO, with both anti-infective function and the relatively stronger affinity to the wounds, can maintain physiological moisture around the wounds and improve local microcirculation to create the conditions suitable
(4) The traditional pasters are mostly internal covers of garlic and eggs or papers, but they are easy to slide and dislocate if there is slight local extraction for their condensation and water impermeability. Moreover, although cotton pieces are water and air permeable, they don’t have uniform thickness and smooth surfaces. However, the paster made of non-woven fabric for repairing ear drum have the advantages of suitable thickness, favorable hardness, smooth surfaces, chemical erosion resistance, water permeability, air permeability, non-toxicity, antisepsis. Non-woven fabric, extensively used in disposal operation coats, caps, masks and etc., is the ideal material of paster for repairing ear drum and the effects of clinical application are satisfactory.