

Bimodal Auditory Stimulation and Rehabilitation

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Commentary

Auditory bimodal stimulation is known when we have two different solutions for bilateral auditory rehabilitation in the same patient, mostly in cases of asymmetric hearing loss. The benefits of binaural and bilateral hearing are already consensus in worldwide literature and they are well established. Individuals with unilateral hearing have many differences when compared those ones with bilateral and binaural hearing. These differences are mainly linked to speech intelligibility, especially in background noise exposure; location of the sound source; music comprehension, and more.

The auditory skills related to binaural effect, are linked within the central auditory cortex, as the *squelch effect*, *shadow of the head effect*, and *binaural redundancy*. We explain each one of these effects next:

1. **Squelch effect:** when the brain receives much sound information from both ears and filters unnecessary sounds, increasing the ability to discriminate sounds- especially in noisy environments.
2. **Shadow of the head effect (or diffraction effect):** a sound originated from the right side of the patient, for example, will reach this side first than the left side due to the physical size of the head. It will also be slightly higher in the right than to the left ear. This diffraction effect will improve speech in noise intelligibility, and assist in the location of the sound source.
3. **Binaural redundancy:** when both ears receive the same sound at the same time, sending the double of sound information to the auditory cortex.

Technology and advances in Otolaryngology and Audiology allows us to offer binaural auditory rehabilitation to the patient, with different approaches and conceptions, and also the bimodal form. As an example, one side can be electrically stimulated by a cochlear implant, and the other side mechanically stimulated by middle ear prostheses; or even acoustically stimulated by a conventional hearing aid. The Otolaryngologist may have to explain

those options to the patient [1-11]. It is important to mention that his duty includes advising and discussing the prognosis, to discuss other treatment options, to discuss bimodal and bilateral rehabilitation methods pre-operatively, and to stimulate the patient post-operatively as well.

We also have to mention that bimodal therapy situations are more laborious, since the *fitting* of such devices are different and the hearing capabilities of each ear are different from each other. It is for the Audiologist the ability to program each device and regulate each one, so that the patient can enjoy the benefits of hearing auditory stimulation it receives in each ear. The *fitting* has such importance and a maladaptive condition can disrupt and damage the hearing performance of the patient. There are numerous scientific evidence supporting the bilateral rehabilitation of hearing, considering the economic aspects of these treatments. The Otolaryngologist may always encourage bilateral hearing rehabilitation of the patient.

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