



Short Report:

Persistent Hiccups Following Stapedectomy

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Citation: Aidonis I, Skalimis A, Kyrodimos E. Persistent Hiccups Following Stapedectomy. *Online J Health Allied Scs.* 2010;9(3):16
URL: <http://www.ojhas.org/issue35/2010-3-16.htm>

Open Access Archives: <http://cogprints.org/view/subjects/OJHAS.html> and <http://openmed.nic.in/view/subjects/ojhas.html>

Submitted: Sep 4, 2010; Accepted: Sep 5, 2010; Published: Oct 15, 2010

Abstract:

Objective: We report a case of a 37 year-old man who developed persistent hiccups after elective stapedectomy. **Method and Results:** The diagnostic approach is discussed as well as the non-pharmacologic and pharmacologic treatments and overall management. The aim is to stress that there is a variety of potential factors that can induce hiccups perioperatively and in cases like this a step by step approach must be taken. **Conclusion:** Persistent hiccups are very rare following stapedectomy, control of them is crucial for the successful outcome. The trigger may be more than one factors and the good response to treatment may be due to dealing successfully with more than one thing.

Key Words: Intractable; Singultus; Stapedectomy; Postoperative hiccups

Introduction:

Hiccups are an irritating symptom that a patient can present with at any time of their life. Perioperatively there is a variety of risk factors that potentially can induce them and set hurdles in the overall management. In ear surgery with implant insertion, movement restriction is crucial especially in the immediate postoperative period. Any unnecessary move is potentially detrimental to the outcome. We present a case in which a patient presented with this kind of symptoms with them persisting for a relatively long time and required a lot of attention from the medical and nursing staff. Management included assessment of the patient's condition, evaluation of risk factors and control of them. Conservative techniques were applied and more invasive ones were considered before the symptom was controlled and finally resolved. Points of interest in the following case were: i) the fact that nature of this particular operation has limited association with this particular symptom, ii) the delay in the commencement which was remarkable, and iii) a range of responses to treatments attempted. All of them produced a variety of possible trigger factors as well as potential treatments of a relatively benign, but rather worrisome symptom.

Case History:

A 37 – year old male was admitted for elective stapedectomy. His past medical history was of no significance, except for bilateral conductive hearing loss running within the family. On preoperative assessment all studies were normal and on systemic examination the only thing that could render him as

ASA II was his increased BMI (34) for which he was on a negative calorie diet, based mainly on vegetables. He was non smoker and with no history of excessive alcohol consumption. What was noticed by surgical and anaesthetic teams was his high apprehension about the operation. That was the decisive reason for scheduling him to have surgery under General Anaesthesia.

Anaesthesia was induced with Propofol 200mg, Fentanyl 100µg, Cis- Atracurium 14mg and Ondansetron 8mg was administered as anti-emetic. Maintenance was achieved with Sevoflurane 2.2% in a mixture of Air and Oxygen (FiO₂: 0.5). Operation was uneventful and lasted 55 minutes. Operative finding of note was severe obliteration otosclerosis. Therefore, footplate of the stapes was opened with the use of a special skeeter 0.8mm diameter and included successful insertion of a platinum and PTFE piston 4.5X0.6mm. Recovery was smooth with no symptoms like headache, nausea or vertigo. During postoperative assessment, there was no nystagmus with positive Weber test on the side of the operated ear. Instructions regarding mobilisation of the patient were given, and it was stressed that excessive movement should be avoided.

His medication postoperatively included intravenous Methylprednisolone given at a rate of 500mg/24hours, intravenous Cefuroxime 750mg tds, Ranitidine 150mg orally bd and Paracetamol 1gram four times a day regularly. He was also prescribed 3mg nocte oral Bromazepam as a sedative for his excessive stress and Piracetam 3mg i.v. tds. His diet was mainly fluids and low salt light food.

Thirty six hours post surgery, patient noticed the start of bothersome hiccups, which initially were just observed and control manoeuvres (i.e. breath holding, sips of cold fluid at certain body position and timing, as well as trials that could elicit vagal reflexes), were attempted avoiding Valsalva technique for obvious reasons. As it continued, and it was thought that operative outcome was at risk, medical treatment was sought.

After Midazolam 2mg was given intravenously for anxiolysis, Lignocaine 1mg/kg was administered i.v. with no response. Magnesium salts were tried both orally and i.v. and patient was reassessed a few hours later. All he was asking at the time was relaxation and Bromazepam 3mg was recommended once again. This seemed to settle hiccups and the patient didn't complain for a couple of hours. Sixteen hours after the presentation of hiccups the symptom recurred. At that time

and due to concerns of causing damage to the implant, directed management was decided. His prescription chart was reviewed thoroughly and the steps taken were: i) cessation of Methylprednisolone as hiccups is a recognised side effect, and ii) discontinuation of Piracetam to avoid possible unnecessary actions, such as hyperkinesia and nervousness thought to be trigger factors for hiccups. In addition to this certain drugs cessation, mobilisation of the patient was initiated and as he complained of flatulence, Domperidone and Pantoprazole were added in his medication instead of solo Ranitidine. Chlorpromazine was considered, but left for later stage. During the course of the next 24 hours there was a gradual decrease in the frequency of the symptoms with only brief free of symptoms periods. The patient noticed an association between bowel movements and severity of symptoms. Therefore, a glycerine enema was arranged and following that, distressing symptoms resolved 50 hours after the initial presentation. He was discharged the next morning, 72 hours post surgery. In the routine follow up three weeks after discharge, he confirmed full discontinuation of the bothersome hiccups and three months later his hearing had improved significantly.

Discussion:

The mechanism of hiccups mainly involves repetitive involuntary contractions of a hemi-diaphragm. Most of the times are self limiting and last only a short period of time. Intractable ones are relatively infrequent and may last in extreme conditions up to several years. Although simple hiccups show no preference to sex and age, persistent ones present more commonly in men.

Phrenic and vagus nerves along with the sympathetic chain from T6-T12, the respiratory centre, medullary reticular formation, and the hypothalamus participate in the development of the hiccup reflex. There is a wide range of trigger factors for hiccups development and may be associated with literally any system of the human body and a certain degree of dysfunction in them, as well as profound underlying disease. Psychological factors cannot be overlooked. In our case likely causes considered, in order of probability from least to most, were: i) intraoperative head position for surgical field optimisation that in this case may stretch the phrenic nerve roots; the late start of the symptom though is against that assumption, ii) anaesthetic agents: Benzodiazepines or short-acting barbiturates that are responsible for similar symptoms were not given during the operation and first presentation was anyway delayed, iii) patient's sex; males are considered to be more prone to intractable hiccups, iv) drugs like Methylprednisolone known to cause hiccups¹ and Piracetam potentially inducing hyperkinesia and nervousness factors that can set off hiccups, v) diet based mainly on vegetables, vi) high apprehension about the operation generating undue stress, vii) limited mobilisation. The latter three factors above could cause delayed gastric emptying and potentially causing abdominal bloating², a combination that can bring out this bothersome symptoms.

Management should focus on the most likely causes of hiccups and eliminate the underlying factors. Laboratory tests seem to be of little value in determining whether treatment interventions are effective.³ Control of symptoms can be achieved either with or without drugs. Non – drug management involves: i) remedies such as stimulation of the nasopharynx i.e. drinking cold water from the wrong side of a glass, tasting vinegar or sipping lemon juice, ii) vagal stimulation obtained with Valsalva manoeuvre, breath holding etc., iii) interventions like phrenic nerve block with local anaesthetics or surgically, microvascular decompression of the vagus nerve, transoesophageal diaphragmatic pacing. All of them should be used in extremely intractable situations⁴, iv) for hypnotherapy and acupuncture⁵ the evidence is limited and their use has some place in psychogenic cases. Drug management is attempted only if these remedies have failed and may be bene-

ficial in the suppression of the symptoms. Drugs that have been involved in the treatment of hiccups are: i) antipsychotic agents like haloperidol and chlorpromazine with good results, ii) prokinetics such as Domperidone or Metoclopramide especially when the suspicious cause is gastrointestinal track dysfunction⁶, iii) antiepileptics (phenytoin, carbamazepine, gabapentin, sodium valproate) have a place since diaphragmatic activity seems to respond well sometimes in their therapeutic doses⁷, iv) other agents including Ketamine, Lignocaine, Midazolam, Bromazepam, Nefopam, Baclofen PPIs or H₂-receptor have been attempted with some success.^{8,9}

In our case there was no specific factor initially and the first steps involved the simple non-drug remedies. As it persisted, more concentration was given in the potential causes. Suspicious drugs were removed from treatment and conditions thought to precipitate it, were managed medically. Therefore anxiety was treated with Bromazepam, gastric stasis with Domperidone and Pantoprazole. Bowel movements were encouraged with mobilisation and glycerine enema which also may result to vagal stimulation having the same effect as digital rectal stimulation has in a similar scenario.¹⁰ Resolution of hiccups was achieved 50 hours after it started and his hearing improved with no further morbidity either associated or not with hiccups.

Conclusion:

Singultus can present as a symptom with or without obvious cause and rarely due to underlying disease. Due to absence of controlled studies, evidence-based recommendations for treatment are difficult to produce. This was a relatively rare case of postoperative intractable hiccups following stapedectomy. Its control was crucial for the success of the operation and patient's wellbeing. Both were eventually obtained. Although uncommon in this particular operation, persistent hiccups are possible to face and ways of managing them should be considered.

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