The Outcome of the Canalith Repositioning Procedure for Benign Paroxysmal Positional Vertigo: Are There Any Characteristic Features of Treatment Failure Cases?

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To demonstrate the success rate of the canalith repositioning procedure (CRP) in our clinic and to establish any characteristic features of cases of treatment failure, we reviewed clinical records of 62 patients who were diagnosed with posterior semicircular canal-benign paroxysmal positional vertigo (BPPV) and treated with the CRP. The basic strategy of the CRP was to rotate the involved canal slowly in the plane of gravity so that free-floating materials could migrate into the utricle only once. After the procedure we instructed patients to keep their heads upright for 10 h and not to sleep on the affected ear for 2 weeks. After the initial treatment, successful results were obtained in 51 of the 62 patients (82.2%). After the second treatment, 56 patients (90.3%) experienced success. Six patients (9.7%) did not obtain resolution even after the second treatment. While 46 patients were diagnosed with idiopathic BPPV, in 16 patients a different diagnosis was determined (head injury in 7 patients, Ménière's disease in 2, vestibular neuritis in 2 and unilateral sensorineural hearing loss in 5). We categorized these 16 patients as having secondary BPPV. Patients with idiopathic BPPV showed a significantly higher success rate with CRP than those with secondary BPPV. Patients with secondary BPPV may have quantitatively or qualitatively different lesions than those with idiopathic BPPV. *Key words*: *benign paroxysmal positional vertigo, canalolithiasis, head injury, otolith, particle repositioning maneuver, semicircular canal.*

INTRODUCTION

The canalith repositioning procedure (CRP) has been reported to be one of the best treatments for benign paroxysmal positional vertigo (BPPV). Neuro-otologists have developed various types of procedure (1–3) and it has been reported that the therapy is highly successful (1–5). While there are many reports of successful results, there are only a few reports of failed cases. In our clinic we have also treated patients with BPPV using the CRP. In order to report the success rate of our procedure and to establish any characteristic features of cases of treatment failure, we reviewed patients who were diagnosed with posterior semicircular canal-BPPV and were treated with the CRP in our clinic.

MATERIALS AND METHODS

The clinical records of 62 patients diagnosed with unilateral posterior semicircular canal-BPPV and treated with the CRP were reviewed. The basic strategy of the CRP was to rotate the involved canal slowly in the plane of gravity so that free-floating materials could migrate into the utricle only once. Basically our procedure is similar to that of Parnes and Price-Jones (3). After the procedure, we instructed patients to keep their heads upright for 10 h and not to sleep on the affected ear for 2 weeks. The diagnosis of BPPV was based on a history of recurrent episodes of brief, position-evoked vertigo and demonstration of the characteristic pattern of nystagmus on Dix–Hallpike test. Responses to treatment were judged at the time of the patients' first visit to our clinic after the procedure (generally 1–2 weeks after the procedure). Responses were classified according to Epley's classification (1): category I, all vertigo (and nystagmus) resolved; category II, BPPV resolved, but other vertigo remains. Free from positional vertigo and induced rotatory nystagmus, but non-positional vertigo still present; category III, partially resolved. Positional vertigo symptoms significantly improved, although still present; category IV, the same or worse. We regarded those patients who were classified as category III or IV after the CRP as failed cases.

RESULTS

The ages of the 62 patients enrolled in this study (21 men, 41 women) ranged from 19 to 79 years (median 63 years) (Table I). In 16 (25.8%) of the 62 patients, a likely diagnosis was determined. This diagnosis was head injury in 7 patients (11.3%), vestibular neuritis in 2 patients (3.2%), Ménière's disease in 2 patients (3.2%) and unilateral sensorineural hearing loss in 5 patients (8.1%) (Table II). The duration of symptoms prior to the CRP ranged from 1 day to 7 years (median duration 20 days).

Table I. *Patient characteristics*

Characteristic		Success	Failure	*P*
Age	Median	63	46	N.S.
(years)	Range	21–71	19-74	(U-test)
Gender	Male	17	4	N.S.
(*n*)	Female	39	2	(χ^2test)
Duration of symptoms	Median	30	9	N.S.
(days)	Range	1 day–7 years	3–30	(U-test)
Diagnosis	Idiopathic	44	2	0.05
(*n*)	Secondary	12	4	(χ^2test)

N.S. = not significant.

The outcome of the CRP is summarized in Fig. 1. After the first CRP, 51 patients (82.2%) experienced category I or II resolution. After the second CRP, 56 patients (90.3%) experienced category I or II resolution. Six (9.7%) of the 62 patients were classified as category III even after the second CRP. Seven of the 56 patients with successful results experienced recurrence.

In order to determine which factors could be associated with treatment failure, we analyzed age, gender, duration of symptoms and diagnosis (Tables I and II). Age, gender and duration of symptoms did not show any significant differences between successful and failed cases. A significant difference in treatment failure rate was observed between idiopathic and secondary BPPV ($p < 0.05$, χ^2-test). In other words, idiopathic BPPV patients showed better response to the CRP than secondary BPPV patients (Table I).

DISCUSSION

Various types of CRP have been advocated for BPPV, and high success rates have been reported (1–5). However, there have only been a few analyses of failure of the CRP. To date, it is controversial whether there are any factors associated with treatment failure.

Table II. *Diagnoses of 62 patients with BPPV*

	n
Idiopathic BPPV	46
Secondary BPPV	16
Head injury	7
Vestibular neuritis	2
Ménière's disease	2
Unilateral sensorineural hearing loss	5

Harvey et al. (6) reported 25 patients with BPPV who were treated with the repositioning maneuver. They reported that the duration of symptoms prior to treatment was greater in non-responders (median 15.5 months) than in complete (median 5.0 months) or partial (median 3.5 months) responders. Fung and Hall (5) divided their patients into three categories: (i) "self-limited" BPPV; (ii) "episodic" BPPV; and (iii) "prolonged" BPPV. They found that patients in category (iii) had the worst outcome to the particle repositioning maneuver.

Parnes and Price-Jones (3) provided three possible mechanisms of poor outcome to the particle repositioning maneuver. Firstly, particles may reverse their direction of movement as the result of a poorly-executed particle repositioning maneuver. Secondly, an obstruction in the posterior semicircular canal may exist. Thirdly, cupulolithiasis may exist.

We think that the possibilities raised by Parnes and Price-Jones should be taken into consideration.

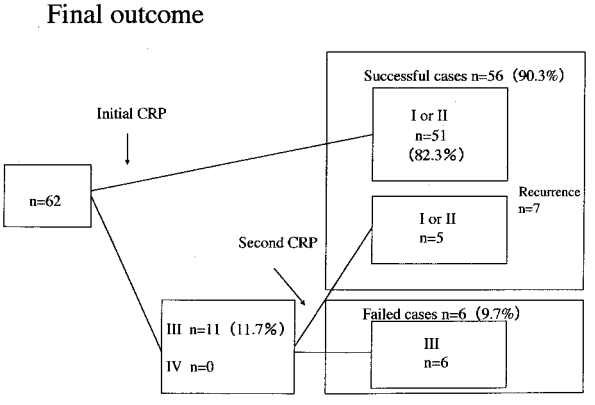

Fig. 1. Outcome of the CRP.

In this study, we found that patients with idiopathic BPPV were better responders to the CRP than those with secondary BPPV. This result may imply that the pathology or pathophysiology of secondary BPPV may differ quantitatively or qualitatively from those of idiopathic BPPV. In other words, secondary BPPV may have a different mechanism of positional vertigo than canalolithiasis, or there may be much more debris in the semicircular canal than in the case of idiopathic BPPV.

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