

Gufoni Maneuver

Horizontal Canal BPPV

Supervisor: 褚嘉慧醫師

Reporter: 丁冠中

Benign Paroxysmal Positional Vertigo

- ⊗ Disease of the peripheral vestibular system
- ⊗ The most common cause of vertigo
- ⊗ Causes
 - ⊗ Canalolithiasis: dislodged otoconia floating in the semicircular canals
 - ⊗ Cupulolithiasis: otoconia are attached to the cupula, situated in the ampulla
- ⊗ The most commonly affected semicircular canal is the posterior canal
 - ⊗ Horizontal canal BPPV accounts for 5% to 22% of cases

Horizontal canal BPPV

- Two types of BPPV involving the horizontal canal
- **Geotropic nystagmus:**
 - Otoconia situated in the **posterior segment** of the lateral canal (canalolithiasis)
 - More intense when the head is turned toward the affected ear
- **Apogeotropic nystagmus:**
 - Otoconia attached to the cupula (cupulolithiasis)
 - Free-floating within the **anterior arm** of the horizontal semicircular canal near the cupula (canalolithiasis).
 - More intense when the head is turned toward the healthy ear.

Treatment of Lateral Canal BPPV

- ⊗ Maneuvers designed to detach the otolithic debris from the cupula or to move the debris from the anterior arm of the horizontal canal to the posterior arm
- ⊗ Lateral canal BPPV with geotropic nystagmus is more responsive to treatment
- ⊗ The maneuvers for treatment of lateral canal BPPV
 - ⊗ Angular accelerations (roll maneuvers, barbecue roll)
 - ⊗ Slow gravitational sedimentation (forced prolonged positioning)
 - ⊗ Sudden linear accelerations (Gufoni maneuver)

Gufoni Maneuver

- ⊗ First described in 1998.
- ⊗ For geotropic nystagmus
 - ⊗ Patient quickly lies down on the side of the **unaffected ear** and remains in this position for 1 to 2 minutes, until the evoked nystagmus subsides. The head is then quickly rotated 45 degrees **toward the floor** and kept in this position for another 2 minutes, after which the patient resumes an upright position
- ⊗ For apogeotropic nystagmus
 - ⊗ Patient quickly lies down on the **affected side** and remains in this position for 1 to 2 minutes after the nystagmus has stopped or has been markedly reduced. Then the head is quickly turned 45 degrees **toward the ceiling** and is held in this position for 2 minutes, after which the patient slowly resumes the sitting position

Gufoni Maneuver

- ⊗ For the geotropic variant

- ⊗ one starts on the unaffected side (side of **weaker nystagmus**), and then proceeds to 45 degree **nose down**

- ⊗ For the ageotropic variant

- ⊗ one starts on the affected side (side of **weaker nystagmus**), and proceeds to 45 degree **nose up**.

- ⊗ 不論哪一種眼振，皆往弱的那一側躺

- ⊗ Geotropic type 往地轉，Apogeotropic 離地轉，每動兩分鐘。

CLINICAL PRACTICE

Caren G. Solomon, M.D., M.P.H., Editor

Benign Paroxysmal Positional Vertigo

Ji-Soo Kim, M.D., Ph.D., and David S. Zee, M.D.

This Journal feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the authors' clinical recommendations.

Horizontal semicircular canal

Geotropic	Supine head roll	Head is turned approximately 90 degrees to each side while patient is in supine position	Geotropic (beats toward the ground)	Barbecue rotation	Head is rotated in three 90-degree increments, for a total of 270 degrees, from affected ear down, to supine, to unaffected ear down, to prone
				Gufoni's maneuver	Patient lies on the side with unaffected ear for 1–2 minutes; head is then rotated 45 degrees in downward direction; patient then assumes sitting position
Vannucchi's forced prolonged position				Forced prolonged position	The patient lies with the unaffected ear down for approximately 12 hours
Apogeotropic	Supine head roll	Head is turned approximately 90 degrees to each side while patient is in supine position	Apogeotropic (beats toward the ceiling)	Gufoni's maneuver	Patient lies on the side with affected ear for 1–2 minutes; head is then rotated 45 degrees in upward position; patient then assumes sitting position
				Head-shaking	Head is shaken from side to side at approximately two cycles per second for 15 seconds

* In ipsiversive nystagmus, the upper pole of the eyes beats toward the side of the affected (lower) ear.

† If the apogeotropic type of benign paroxysmal positional vertigo is converted to the geotropic type, treatment for the geotropic type should be provided.

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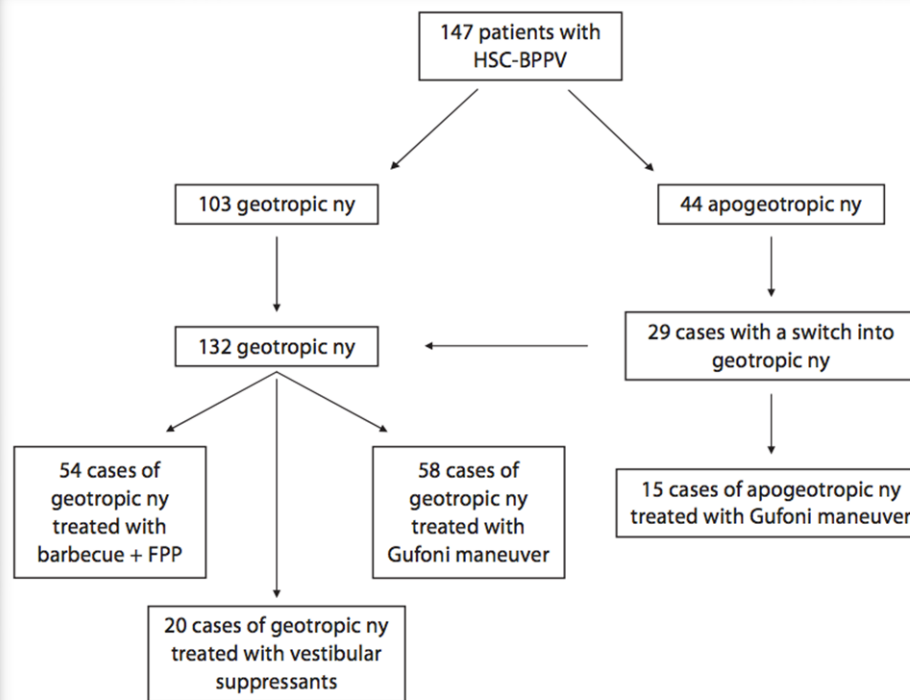
Horizontal Semicircular Canal Benign Paroxysmal Positional Vertigo: Effectiveness of Two Different Methods of Treatment

Augusto Pietro Casani^a Andrea Nacci^b Iacopo Dallan^a Erica Panicucci^c
Mauro Gufoni^d Stefano Sellari-Franceschini^a

^aOtorhinolaryngology Section and ^bChair of Audiology and Phoniatrics, Department of Neurosciences, and

^cDepartment of Experimental Pathology, University of Pisa, Pisa, and ^dOtolaryngology Section, Spedali Riuniti, Livorno, Italy

- ⊗ Barbecue maneuver + forced prolonged position (FPP) vs Gufoni maneuver.
- ⊗ From January 2001 to June 2008
- ⊗ 147 patients affected by HSC-BPPV
 - ⊗ 103 Geotropic type and 44 Apogeotropic type



- ❶ The higher percentage of success (statistically significant) with the Gufoni maneuver at the first session of treatment (86 vs. 61%).
- ❷ The final control showed that 44 out of 54 (81%) patients treated with the barbecue maneuver + FPP were symptom free compared to 54 out of 58 (93%) treated with the Gufoni maneuver.

Table 2. Results of the treatment (mean outcome indicator: no nystagmus in the Pagnini-McClure positioning maneuver)

	Symptom-free patients		p value (comparison between the 2 groups)
	barbecue + FPP method	Gufoni maneuver	
1st session	33 (61%)	50 (86.2%)	0.0024
2nd session	38 (70.3%)	52 (89.6%)	0.0103
3rd session	43 (79.6%)	54 (93.1%)	0.036
30 days of follow-up	44/54 (81.4%)	54/58 (93.1%)	0.0631
PSC switch during treatment	1 (1.8%)	4 (6.9%)	

- ⊗ The most evident result is the higher percentage of success (statistically significant) with the Gufoni maneuver at the first session of treatment (86 vs. 61%).
- ⊗ Both the barbecue maneuver + FPP and the Gufoni maneuver are valid methods for treating HSC-BPPV (geotropic forms).
 - ⊗ a success rate of over 80% at the follow-up on the 30th day.

Conclusions

- ⊗ The Gufoni maneuver has a significant advantage over the barbecue method:
 - ⊗ the success rate shown at the follow-up, while without statistical significance, is undoubtedly higher (93% compared with 81%)
 - ⊗ the disorder is more quickly cured with the Gufoni maneuver (86 of the subjects treated in this manner were symptom-free after the first session compared with 61% of those who underwent the barbecue + FPP method).
- ⊗ It is very easy to perform and that patient compliance is better, especially if they are affected with some disorder that limits their movement, with Gufoni maneuver

Treatment of the Horizontal Semicircular Canal Canalithiasis: Pros and Cons of the Repositioning Maneuvers in a Clinical Study and Critical Review of the Literature

*Stavros Korres, †Maria G. Riga, *John Xenellis, ‡George S. Korres,
and †Vasilios Danielides

**ENT Department, Hippocrateion General Hospital of Athens, National University of Athens, Athens; †ENT
Department, University Hospital of Alexandroupolis, Democritus University of Thrace, Alexandroupolis; and
‡ENT Department, Attikon General Hospital of Athens, National University of Athens, Athens, Greece*

- ⊗ Prospective clinical study
- ⊗ 60 patient diagnosed with HSC canalithiasis (Bilateral geotropic nystagmus)
 - ⊗ Baloh's maneuver (n = 13),
 - ⊗ Vannucchi's forced prolonged position (n = 29),
 - ⊗ Asprella-Gufoni maneuver (n = 18).

Results & Conclusions

- ⊗ The Asprella-Gufoni maneuver and Vannucchi's forced prolonged position both seem to be significantly more effective than the Baloh's maneuver in the treatment of HSC canalithiasis.
 - ⊗ with success rates of 76% and 89%, respectively, vs. 38%
- ⊗ The important pros of the Asprella-Gufoni maneuver versus Vannucchi's forced prolonged position
 - ⊗ Patient's convenience and maximal use of gravitational and angular acceleration forces.

Randomized clinical trial for geotropic horizontal canal benign paroxysmal positional vertigo.

Kim JS¹, Oh SY, Lee SH, Kang JH, Kim DU, Jeong SH, Choi KD, Moon IS, Kim BK, Kim HJ.

⊕ Author information

Abstract

OBJECTIVES: To determine the immediate and long-term therapeutic efficacies of barbecue rotation and Gufoni maneuvers, a randomized, prospective, and sham-controlled study was conducted in patients with the geotropic type of benign paroxysmal positional vertigo involving the horizontal semicircular canal (HC-BPPV).

METHODS: In 10 nationwide dizziness clinics in Korea, 170 consecutive patients (107 women, age range 11-97 years, mean age \pm SD 61 \pm 15 years, median = 61 years) with geotropic HC-BPPV were randomly assigned to barbecue rotation (n = 56), Gufoni (n = 64), or sham maneuver (n = 50). An immediate response was determined within 1 hour after a maximum of 2 trials of each maneuver on the visit day. We also assessed the cumulative results of each maneuver by following up the patients for 1 month.

RESULTS: After a maximum of 2 maneuvers on the initial visit day, barbecue rotation (38 of 55 [69.1%]) and Gufoni (39 of 64 [60.9%]) maneuvers showed better responses than the sham maneuver (17 of 48 [35.4%]). The cumulative therapeutic effects were also better with barbecue rotation (p = 0.006) and Gufoni (p = 0.031) maneuvers than with the sham maneuver. However, therapeutic efficacies did not differ between the barbecue rotation and Gufoni groups in terms of both immediate (p = 0.46) and long-term (p = 0.10) outcomes.

CONCLUSION: Using a prospective randomized trial, we demonstrated that barbecue rotation and Gufoni maneuvers are effective in treating geotropic HC-BPPV. Classification of evidence: This study provides Class I evidence that barbecue rotation and Gufoni maneuvers are effective in the treatment of geotropic HC-BPPV.

Double-Blind Randomized Trial on the Efficacy of the Gufoni Maneuver for Treatment of Lateral Canal BPPV

Marco Mandalà, MD; Emanuela Pepponi, MD; Giovanni Paolo Santoro, MD; Jacopo Cambi, MD;
Augusto Casani, MD; Mario Faralli, MD; Beatrice Giannoni, MD; Mauro Gufoni, MD;
Vincenzo Marcelli, MD; Franco Trabalzini, MD; Paolo Vannucchi, MD; Daniele Nuti, MD

Objectives/Hypothesis: The need for class I and II studies on the efficacy of liberatory maneuvers in the treatment of lateral canal benign paroxysmal positional vertigo (LC-BPPV) motivated the present double-blind randomized trial on the short-term efficacy of the Gufoni liberatory maneuver (GLM).

Study Design: Double-blind randomized controlled trial.

Methods: Seventy-two patients with unilateral LC-BPPV were recruited for a multicentric study. Patients were randomly assigned to treatment by GLM ($n = 37$) or sham treatment ($n = 35$). Subjects were followed up twice (at 1 hour and 24 hours) with the supine roll test by blinded examiners.

Results: At 1- and 24-hour follow-up, 75.7% and 83.8% of patients, respectively, undergoing GLM had recovered from vertigo, compared to around 10% of patients undergoing the sham maneuver ($P < 0.0001$).

Conclusion: To the best of our knowledge, this is the first class I study on the efficacy of the GLM in the treatment of LC-BPPV in both geotropic and apogeotropic forms. GLM proved highly effective compared to the sham maneuver ($P < 0.0001$). The present class I study of the efficacy of the GLM changes the level of recommendation of the method for treating LC-BPPV from level U to level B for the geotropic variant and from level B to level A for the apogeotropic variant of LC-BPPV.

Key Words: Benign paroxysmal positional vertigo, Gufoni liberatory maneuver, evidence-based, double-blind randomized trial, vestibular, semicircular canals.

Level of Evidence: 1b.

Laryngoscope, 123:1782-1786, 2013

- ❁ Double-blind randomized controlled trial.
- ❁ Gufoni Maneuver vs Sham maneuver
- ❁ Seventy-two patients with unilateral LC-BPPV
- ❁ Patients were randomly assigned to treatment by Gufoni Maneuver ($n = 37$) or sham treatment ($n = 35$).
- ❁ Subjects were followed up twice (at 1 hour and 24 hours) with the supine roll test by blinded examiners.

Results & Conclusion

- ⊗ At 1- and 24-hour follow-up, 75.7% and 83.8% of patients, respectively, undergoing Gufoni maneuver had recovered from vertigo
 - ⊗ Compared to around 10% of patients undergoing the sham maneuver ($P < 0.0001$).
- ⊗ The first class I study on the efficacy of the Gufoni maneuver in the treatment of LC-BPPV in both geotropic and apogeotropic forms.
- ⊗ The level of recommendation of the Gufoni maneuver for treating LC-BPPV
 - ⊗ from level U to level B for the geotropic variant
 - ⊗ from level B to level A for the apogeotropic variant

Systematic Review: Efficacy of Gufoni Maneuver for Treatment of Lateral Canal Benign Paroxysmal Positional Vertigo with Geotropic Nystagmus

Emke Mechelina Josephina Margo van den Broek, MD¹,
Hester Josephine van der Zaag-Loonen, MD, PhD¹, and
Tjasse Doewe Bruintjes, MD, PhD¹

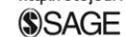
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DOI: 10.1177/0194599814525919
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Table 3. Descriptions of Studies on the Efficacy of the Gufoni Maneuver for the Treatment of Lateral Canal BPPV with Geotropic Nystagmus.

Study	Gufoni Maneuver (Geotropic/Apogeotropic)	Comparing Treatment (Geotropic/Apogeotropic)	Test Procedure	Evaluation Times/ Follow-Up
Mandalà et al ¹	n = 37 (27/10)	Sham ^a : n = 35 (26/9)	2 maneuvers, consecutively performed	Evaluation: 1 hour, 24 h Follow-up: 2 wk
Kim et al ⁷	n = 64 (64/0)	BBQ: n = 56 (56/0) Sham ^b : n = 50 (50/0)	Maximum of 2 maneuvers, repeated after 1 h	Evaluation: 1 h after each maneuver Follow-up: 1 mo
Casani et al ²	n = 73 (58/15)	BBQ+FPP: n = 54 (54/0) Vestibular suppressants: n = 20 (20/0)	Maximum of 3 maneuvers, repeated after 1 d	Evaluation: 1 d, 2 d, 3 d Follow-up: 1 mo

Abbreviations: BBQ, barbecue roll; BPPV, benign paroxysmal positional vertigo; FPP, forced prolonged position.

^aGufoni maneuver performed on the wrong side.

^bOpposite of the first step of BBQ roll.

Conclusion

- ⊗ There is some evidence for a significant positive effect of the Gufoni maneuver to treat patients with lateral canal BPPV with geotropic nystagmus.
- ⊗ The maneuver is easy to perform and, therefore, particularly suitable for older, immobile, and obese patients.
- ⊗ However, at present, there are insufficient data to establish the relative efficacy of this maneuver in comparison to other maneuvers.

Thank You