

Morrissey's Cough Test - A Student Friendly Modification

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Research Article

Abstract: Morrissey's cough test is poorly described in recent text books of surgery and the students have difficulty in recognizing the response to cough. Here we suggest a simple modification of the test which makes it easier for the student to recognize the retrograde flow in the saphenofemoral junction.

Keywords: varicose veins, cough impulse test, SFJ incompetence.

Introduction

Morrissey's cough test is designed to detect incompetent sapheno-femoral junction (SFJ) and it is an easy test to perform but the appreciation of response to cough and interpretation of the finding have always been difficult for the medical student, because the test is not adequately described in recent textbooks of surgery. It is true that the importance of physical examination is diminishing due to the availability of sophisticated investigations. But still, any opportunity to teach medical student proper clinical examination should always be fully utilized. With this in mind, the first author has devised a modification of Morrissey's cough impulse test.

Standard Morrissey's cough Test

Many recent surgery textbooks describe the test as follows: the patient is asked to cough and an impulse on coughing is observed at the saphenous opening. In the student's mind a cough impulse is similar to the one he usually observes in hernia. The fact that the cough impulse in SFJ incompetence is a fluid thrill is not at all being emphasized in recent text books. Harold Dodd in his article titled "The diagnosis of varicose veins"¹ describes the cough impulse test as follows: "The cough impulse is a....A hand is placed on the enlarged veins in the leg or thigh, the patient turns the face to the ceiling and is asked to cough vigorously. Nothing, grading up to a just perceptible impulse, to an expansile impulse and a thrill may be felt. The impulse is felt best at the termination of the internal saphenous vein in the groin..... A possible error in the cough impulse test is to mistake for an expansile impulse, the slight jerk in the leg when some patients cough." Shyam Krishnan, and Stephen C. Nicholls in their article "Chronic Venous Insufficiency: Clinical Assessment and Patient Selection"² describes the

cough impulse test as follows:"The cough impulse test is performed by palpating the thigh at the fossa ovalis over the saphenofemoral junction (SFJ) while the patient is standing. The patient is asked to cough, and a palpable thrill at the SFJ, which is a result of turbulent retrograde flow, indicates reflux at the SFJ. The cough impulse test is difficult to perform in obese patients or in patients who jerk or cough vigorously". The last description is clear cut and describes the test in precise terms. The difficulties faced by the student while interpreting the test results are as follows:

1. He is not sure of the nature of the cough impulse
2. The duration of the cough impulse is very brief and
3. There is a jerky contraction of the lower abdominal muscles and thigh at the time of coughing which interferes with observation.

Modification of Morrissey's cough Test

To overcome these difficulties we propose a modification of this test. Instead of coughing, patient is asked to perform a Valsalva maneuver. The test is done as follows: The patient lies supine and the veins are emptied by elevation of the leg and after emptying, the leg is lowered. The student is asked to place the palmar surface of the extended fingers on the thigh over the region of saphenofemoral junction. The hand should be placed lightly without compressing the great saphenous vein. The patient is asked to take a deep breath and strain. When the patient strains, a fluid thrill due to turbulent retrograde flow, will be felt by the palpating fingers. This indicates incompetent saphenofemoral junction. In this modification, three problems mentioned above are remedied.

1. The student is informed that the cough impulse will be a fluid thrill due to retrograde flow.
2. The duration of Valsalva maneuver is much longer than a cough.
3. There is no jerky contraction of the lower abdominal muscles or thigh during Valsalva maneuver.

Materials and Method

During the period from December 2013 to March 2014, a pilot study was conducted. 23 patients with varicose veins attended our institution. Of these, 18 patients had SFJ incompetence, proved by Color Doppler study. These 18 were included in the study. Both authors examined these 18 patients for cough impulse and found that only 9 (50%) had a positive cough impulse. Both authors concurred on this finding. This percentage is accordance

Results

Table 1: The results are given in

Serial number of patient	Age	Sex	No. of students able to detect impulse on standard cough test (out of 10)	No. of students able to detect impulse on modified test (out of 10)
1	55	M	4	10
2	34	F	3	10
3*	47	F	3	9
4	32	M	5	10
5	41	M	4	10
6*	30	F	3	8
7	50	M	4	10
8	29	M	5	10
9	33	F	3	10

*Obese female patients

Only 34 out of 90 students were able to appreciate a positive cough impulse on standard test. With the modified test 87 out of 90 students were able to appreciate the positive impulse. A statistical analysis could not be done because each patient was examined by different set of 10 students. But these results show that with modified test using a Valsalva maneuver more students were able to appreciate the impulse.

Discussion

Morrissey's cough test is based on the fact that during coughing intra abdominal pressure increases which leads to turbulent retrograde flow in the great saphenous vein when saphenofemoral junction is incompetent. Valsalva maneuver is a better choice for increasing the intra-abdominal pressure compared to cough. Average intra abdominal pressure developed during Valsalva maneuver is estimated to be around 195 cm H₂O⁴ and the average intra thoracic pressure developed is around 67cm H₂O. During valsalva maneuver, the diaphragm is contracting and thereby causing a greater increase in intra abdominal pressure compared to intrathoracic pressure. In contrast, the intra abdominal pressure generated during cough is only around 45 cm H₂O⁵. The intrathoracic pressure generated during a cough can vary from 100 -250 mmHg. The duration of such a pressure increase in coughing is about 1 second⁶. The duration of Valsalva maneuver can easily extend for more than 5 seconds. Thus, both in terms of intra abdominal pressure generated and duration of such pressure increase Valsalva maneuver scores over cough. Hence, in the modified Morrissey's test the intra abdominal pressure generated (which is required to

with established studies³ which have shown that the sensitivity of cough impulse test is around 50%. Each patient was examined by a batch of 10 final MBBS students. The students were instructed as to how to perform the cough impulse test and what a positive impulse is. Then the students were informed about the modified test and asked to perform the modified test.

produce retrograde venous flow) is higher, and the duration of the pressure increase is longer compared to cough. In addition, the jerky movements of lower abdominal musculature and thigh which occur during cough is absent during Valsalva maneuver. All these three factors make the modified Morrissey's test student friendly.

Conclusion

To detect incompetence of the SFJ, modified Morrissey's test is better in which Valsalva maneuver replaces coughing. It is to be emphasized that the impulse felt during valsalva maneuver is a fluid thrill rather than an expansile impulse.

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