

## Music, a Simple Mean to Reduce Pain and Anxiety Feeling During Varicocele Embolization

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### Abstract

**Aim:** The aim of this study was to evaluate the use of music to reduce pain and anxiety during varicocele scleroembolization.

**Material and Methods:** From January 2014 to January 2015, 67 patients undergoing scleroembolization were enrolled randomly in two groups and 60 considered for statistical evaluation. The patients were randomized to hear (Group A) (n=31) or not hear (Group B) (n=36) music during the procedure. The patients were asked to rate their anxiety and pain just before the procedure and every 15 minutes ('). We used the verbally administered linear anxiety rating (VAR) to measure anxiety, and the visual analogue score (VAS) for pain. The patients were also asked to state the perceived duration of the procedure. All data were evaluated by using Mann-Whitney test.

**Results:** Five patients in each group were excluded for statistical evaluation. We found a statistically significant difference in anxiety between the two groups in favour of Group A in the VAR test done at 30'(P= 0.005) and 45'(P= 0.04). No statistically significant difference was noted before the procedures and at 15'. We also found a statistically significant difference in VAS again in favour of Group A, at 15'(P=0.002), 30'(P=0.01) and 45' (P=0.02). No difference was noted before the procedures. There was not enough data available for the procedures (n=2) lasting more than 60' in both groups. A statistically significant difference was also noted in the perception of procedure duration in favour of the music group (P=0.0005).

**Conclusion:** Our data suggest that music can be considered an effective means to reduce anxiety and pain during percutaneous varicocele scleroembolization.

**Keywords:** Varicocele; Embolization; Music

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### Introduction

Many interventional radiological procedures are performed with the patient under light sedation or under local anesthesia; a patient who undergoes an interventional procedure is often in a state of anxiety and he reaches the operating room concerned about the success of the intervention or the possible complications [1]. Furthermore the main fear of a patient who knows that he will face an interventional procedure in a state of consciousness or with mild sedation is whether he will feel pain. Anxiety may also be related to the symptoms of an underlying disease, the lack of knowledge regarding a diagnosis, uncertainty of the chain of events to occur, and fear of unknown or unexpected findings [1].

Many studies have assessed the efficacy of non-pharmacological analgesia such as an adjunct hypnotic in reducing pain and anxiety perception during medical procedures [1,2].

In literature the role of music during surgical or medical procedures has also been evaluated controversially, in particular its use during minimally invasive procedures in outpatients [3-5]. The aim of our study is to evaluate the effectiveness of music in controlling anxiety and pain during interventional procedures and in particular during varicocele embolization. We chose this intervention because the population undergoing such procedure is quite homogeneous (young adults) and the technique is quite standard and constant.

## Materials and Methods

Institution Review Board (IRB) approval was obtained for this study. From January 2014 to January 2015, 67 patients undergoing left spermatic vein scleroembolization were enrolled in this study and randomized to perform the procedure with or without music in the angiographic suite during the intervention. At the moment in which we scheduled each patient for the intervention we asked for the consent to be enrolled in the study (possibility to hear music during the intervention), furthermore we asked patients to bring a CD with their own relaxing music by their headphones. The music thus could be heard only by patients while the room was kept quiet as done routinely, this because previous study demonstrated that operators could be positively or negatively influenced by music, affecting the procedure time [6,7].

Randomization was performed just before the procedure; we put in an envelope two letters (A or B) in order to know if the procedure would be performed with or without music. The patients were asked to rate their anxiety level and the pain just before the procedure and every 15 minutes. We used the verbally administered linear anxiety rating (VAR) a valid and clinically effective for the assessment of anxiety in medical settings [8]. Advantages of the VAR include rapid administration and immediate interpretability, without the need for scoring procedures. For pain we used the visual analogue score (VAS).

The patients were also asked to refer their feeling regarding the procedure duration. We also recorded any medication administered for sedation. The technique used for scleroembolization was similar to the standard one reported in a recent review [8-10] and no premedication was administered. We used atoxisclerol (Polidocanol) as the sclerosant agent and in case of incomplete embolization, coils were also inserted. To

reduce any bias, the procedures were performed in conditions as similar as possible, i.e. only by an operator with 10 years' experience (AB), in only one angiographic room with constant temperature and lighting. For the statistical analysis patients were distinguished in two groups: to hear (Group A) or not hear (Group B) music during the procedure. All data was evaluated by using the Mann-Whitney test. During the same period, two patients refused to be enrolled in the study.

## Results

The population data are reported in (Tables 1 and 2). One patient in Group A and six patients in Group B needed sedation with a dose of 3 mg of midazolam for Group A, and ranging between 3 and 5 mg of midazolam in Group B. Those patients were not considered for statistical evaluation.

Thus a total of 30 patients in each group were considered for statistical evaluation (Group A, age range 16 years to 36 years old, mean 27 years; Group B age range 17 years to 37 years old, mean 24 years). We found a statistically significant difference in anxiety level between the two groups in favour of those procedures performed with music in VAR test evaluations done at 30'(P=0.005) and 45'(P=0.04). No statistically significant difference was noted before the procedures and at 15'.

Regarding the pain, we found a statistically significant difference in VAS evaluations between the two groups, again in favour of group A, at 15' (P=0.002), 30' (P=0.01) and 45' (P=0.02). No difference for VAS test was noted before the procedures. There were not enough data to evaluate for the procedure lasting more than 60' in both groups (n=2).

A statistically significant difference was also noted for the perception of procedure duration, again in favour of the music group (P=0.0005).

**Table 1:** Summary of population treated with music during the intervention.

Patient	Baseline Anxiety ( )	15'	30'	45'	60'	Perception of the duration of the procedure (')	Duration of the procedure (')
Age (years)	Pain [ ]	Anxiety ( ) Pain [ ]	Anxiety ( ) Pain [ ]	Anxiety ( ) Pain [ ]	Anxiety ( ) Pain [ ]		
1	-5	-5	-4	-2	-	30'	46'
19years	[0]	[2]	[3]	[1]	-		
2	-7	-4	-5	-	-	20'	35'
32 years	[0]	[1]	[3]	-	-		
3	-2	-2	-2	-2	-	25'	45'
23 years	[0]	[1]	[2]	[2]	-		
4	-8	-7	-5	-	-	30'	38'
35 years	[0]	[1]	[2]	-	-		
5	-6	-4	-4	-4	-	40'	50'
27 years	[0]	[1]	[2]	[2]	-		
6	-9	-7	-7	-	-	45'	37'
17 years	[0]	[3]	[3]	-	-		
7	-3	-2	-2	-	-	30'	35'
29 years	[0]	[1]	[2]	-	-		
8	-9	-8	-7	-4	-	45'	50'
32 years	[0]	[3]	[5]	[3]	-		
9	-6	-4	-3	-	-	25'	32'
26 years	[0]	[1]	[3]	-	-		

10	-4	-5	-5	-5	-	40'	47'
33 years	[0]	[2]	[4]	[2]	-		
11	-6	-4	-4	-	-	55'	48'
31 years	[0]	[1]	[3]	-	-		
12	-5	-5	-5	-5	-	40'	45'
24 years	[0]	[2]	[2]	[3]	-		
13	-3	-2	-3	-2	-	25'	45'
18 years	[0]	[2]	[3]	[2]	-		
14	-2	-3	-4	-5	-	40'	48'
23 years	[0]	[1]	[3]	[4]	-		
15	0	-1	-1	-	-	30'	32'
36 years	[0]	[2]	[3]	-	-		
16	-2	-2	-3	-4	-3	60'	60'
20 years	[0]	[1]	[2]	[3]	[3]		
17	-8	-10	-7	-	-	45'	33'
17 years	[0]	[1]	[2]	-	-		
18	-5	-4	-3	-	-	20'	37'
19 years	[0]	[1]	[3]	-	-		
19	-4	-5	-4	-	-	30'	35'
28 years	[0]	[3]	[3]	-	-		
20	-6	-7	-7	-6	-	40'	48'
19 years	[0]	[2]	[3]	[2]	-		
21	-4	-4	-4	-	-	30'	35'
22 years	[0]	[3]	[4]	-	-		
22	-7	-7	-6	-	-	40'	35'
30 years	[0]	[1]	[2]	-	-		
23	-2	-2	-2	-1	-	60'	50'
34 years	[0]	[1]	[3]	[3]	-		
24	-6	-7	-6	-5	-	40'	45'
18 years	[0]	[2]	[3]	[2]	-		
25	-8	-8	-5	-	-	40'	35'
32 years	[0]	[3]	[2]	-	-		
26	-2	-4	-3	-3	-	60'	50'
16 years	[0]	[2]	[4]	[2]	-		
27	-3	-3	-3	-	-	20'	30'
26 years	[0]	[1]	[3]	-	-		
28	-2	-2	0	0	-	40'	45'
34 years	[0]	[1]	[3]	[2]	-		
29	-2	-4	-3	-	-	40'	34'
19 years	[0]	[2]	[3]	-	-		
30	-6	-5	-3	-2	-	40'	46'
31 years	[0]	[1]	[2]	[2]	-		

## Discussion

Among all interventional procedures, percutaneous varicocele embolization is one of the fastest and less invasive; it is frequently performed with or without mild sedation in an outpatient setting. All the procedures are frequently technically similar, likely to last less than 60 minutes and are commonly performed in young adults; for this reason we chose this quite homogeneous population and this procedure to evaluate the effectiveness of music in reducing pain and anxiety perception.

The efficacy of music for the treatment of pain has not been totally established. Several studies have evaluated the effect of

music on acute, chronic or cancer pain intensity, pain relief, and analgesic requirements. In a recent review [11, 12], randomized controlled trials on the effectiveness of music on any type of pain in children or adults were evaluated. The authors assumed there was a considerable variation in the effect of music, with the exception of studies on acute postoperative pain in which the analgesic effect of music was clear. The authors concluded that music is a safe, inexpensive and easy to administer adjunctive therapy to reduce pain in association with medical procedures and operations.

We found a statistically significant difference in anxiety level between the two groups in favour of those procedures performed

**Table 2:** Summary of population treated without music during the intervention.

Patient ( )	Baseline Anxiety ( )	15'	30'	45'	60'	Perception of the duration of the procedure (')	Duration of the procedure (')
Age (years)	Pain [ ]	Anxiety ( )	Anxiety ( )	Anxiety ( )	Anxiety ( )		
		Pain [ ]	Pain [ ]	Pain [ ]	Pain [ ]		
1	-7	-7	-7	-	-	30'	36'
29 years	[0]	[2]	[2]	-	-		
2	-6	-5	-5	-4	-	60'	47'
22 years	[0]	[1]	[3]	[3]	-		
3	-4	-3	-4	-	-	35'	35'
26 years	[0]	[2]	[4]	-	-		
4	-6	-7	-7	-6	-	50'	48'
32 years	[0]	[2]	[4]	[4]	-		
5	-6	-8	-6	-	-	40'	30'
27 years	[0]	[3]	[3]	-	-		
6	-7	-8	-8	-7	-	60'	45'
19 years	[0]	[3]	[4]	[3]	-		
7	-3	-3	-3	-3	-	48'	49'
24 years	[0]	[2]	[3]	[3]	-		
8	-7	-7	-8	-	-	60'	35'
31 years	[0]	[3]	[4]	-	-		
9	-6	-5	-6	-5	-	45'	48'
18 years	[0]	[2]	[3]	[3]	-		
10	-8	-8	-8	-7	-	60'	47'
31 years	[0]	[2]	[4]	[3]	-		
11	-6	-7	-7	-	-	60'	48'
21 years	[0]	[2]	[3]	-	-		
12	-4	-6	-7	-6	-	60'	52'
34 years	[0]	[2]	[3]	[3]	-		
13	-3	-4	-5	-5	-4	90'	64'
28 years	[0]	[2]	[3]	[3]	[3]		
14	-2	-3	-3	-3	-	50'	48'
19 years	[0]	[1]	[2]	[2]	-		
15	-2	-2	-3	-4	-	30'	32'
18 years	[0]	[1]	[3]	[3]	-		
16	-2	-2	-3	-	-	40'	30'
22 years	[0]	[1]	[2]	-	-		
17	-7	-9	-7	-	-	45'	33'
35 years	[0]	[3]	[3]	-	-		
18	-5	-5	-6	-5	-	30'	37'
32 years	[0]	[1]	[3]	[4]	-		
19	-2	-2	-3	-	-	30'	30'
18 years	[0]	[3]	[3]	-	-		
20	-8	-8	-7	-	-	60'	36'
35 years	[0]	[3]	[3]	-	-		
21	-2	-5	-4	-3	-	60'	50'
22 years	[0]	[2]	[4]	[2]	-		
22	-5	-7	-5	-	-	35'	34'
29 years	[0]	[3]	[2]	-	-		
23	-6	-7	-7	-4	-	60'	48'
34 years	[0]	[2]	[4]	[2]	-		
24	-2	-5	-5	-4	-	50'	50'
37 years	[0]	[4]	[4]	[2]	-		
25	-1	-3	-3	-3	-	60'	46'
30 years	[0]	[2]	[3]	[2]	-		
26	-2	-4	-4	-	-	35'	30'
19 years	[0]	[3]	[4]	-	-		

27	-8	-8	-7	-	-	90'	48'
28 years	[0]	[3]	[3]	-	-		
28	-4	-5	-5	-4	-	45'	50'
34 years	[0]	[2]	[4]	[2]	-		
29	-2	-4	-4	-3	-	50'	50'
17 years	[0]	[2]	[4]	[2]	-		
30	-4	-6	-5	-	-	60'	50'
33 years	[0]	[3]	[3]	-	-		

with music in VAR test evaluations only at 30' and 45' and not at 15' when, at the beginning of the procedure, the anxiety level of all the patients is greater.

Regarding the pain, we found a statistically significant difference in VAS evaluations between the two groups, again in favour of those procedures performed with music while no difference was noted before the procedures.

In our study, even if studies that permitted patients to select the music did not reveal a benefit from music, the statistically significant differences in anxiety and pain between the two groups in favour of those procedures performed with music assess the role of its use alone or as adjunct non pharmacological analgesia for interventional procedures. This represents a simple way to reduce the anxiety and pain in particular in outpatients.

In our opinion, it should be emphasized that our data suggest that music contributes to a perception of lesser duration of the procedure because a statistically significant difference was also noted for the perception of procedure duration in favour of the group with music.

## Conclusion

Based on our experience, the data collected and the clinical verification, we can conclude that music can be considered an effective means of reducing anxiety and pain perception during the treatment of varicocele with percutaneous scleroembolization. In fact, we think that the use of music should come in standardized protocols and surgical anesthetic especially in the short term or day surgery procedures.

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