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Effectiveness of Fast, Reliable and Safe (FARES) Method as A New Reduction Technique for Management of Acute Anterior Shoulder Dislocation: A Systematic Review of Recent 10-year Studies Since It Invented

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Abstract

The FARES method is a fast, reliable, and safe way to reduce anterior glenohumeral dislocations. Reduction is performed by one physician, without the need to use analgesics or anesthesia. This method has been proven to be effective and has not been accompanied by complications. Moreover, it appears to be less painful and is faster than other methods of reducing glenohumeral dislocations. This systematic review was conducted based on PRISMA guideline. Literature research was primarily performed using the Pubmed, EMBASE, and Cochrane Library to search for studies about effectiveness of FARES method in management of acute anterior shoulder dislocation to November 23rd, 2019 with the keywords "FARES " OR "Fast Reliable Safe" AND "Method" OR “technique” OR “Closed Reduction” AND "anterior shoulder dislocation" OR "acute shoulder dislocation". We filtered the search to include only studies in human, published in the last 10 years, and ones written in English. After that, we combed through all articles cited and citing the articles so as not to miss any relevant articles. From 4 articles, 2 articles were prospective randomized controlled trial study (level I of evidence) and 2 articles were descriptive case series and prospective study (level III and IV of evidence) respectively. Characteristic of reduction outcome included in this systematic review were VAS, reduction time, success rate of reduction in first attempt and complication during this method. FARES method in most article result in VAS < 2 with FARES method. Reduction time of FARES method ranging from 0.5 – 2.5 minutes. All articles show good success rate of reduction in first attempt with FARES method ranging from 75%-92.54%. There is no any complication obtained after anterior shoulder dislocation reduction with FARES method. This systematic review reports successful outcome of FARES method application in patient with anterior shoulder dislocation and this method could be promising technique in cuurent treatment of anterior shoulder dislocation.

Keywords: *anterior shoulder, dislocation, reduction, technique, fares*

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INTRODUCTION

Shoulder dislocation is the most common large joint dislocation in the body, with an incidence of 1.7%1 or 8.2–17 per 100 000 per year. (Dala-Ali, Penna, McConnell, Vanhegan, & Cobiella, 2014).The shoulder can dislocate anteriorly (accounting for 97% of shoulder dislocations), posteriorly (in 2–4% of the cases), and inferiorly (in 0.5% of the cases) (Zacchilli & Owens, 2010). Dislocations of the shoulder joint occur more frequently compared to dislocations of the other major joints, which can be attributed to the unstable anatomical structure of the shoulder. The glenoid is very small and shallow, providing the ability to move in a wide range of motion. However, the limited articulating surface with the humeral head makes the joint inherently susceptible to instability. (Alkaduhimi, van der Linde, Willigenburg, van Deurzen, & van den Bekerom, 2017).

The management of first episode of anterior shoulder dislocation is closed reduction followed by immobilization and rehabilitation therapy. Various method and technique of closed reduction are used for anterior shoulder dislocation with various outcome of pain and the time that needed for reduction to be completed. A systematic comparison of closed reduction technique conducted by Alkaduhimi et al (2017) has explored the effectiveness and outcome of numerous closed reduction techniques. The techniques that have highest success rate including FARES method, traction-countertraction and scapular manipulation technique. FARES method is relatively superior because this method has less time needed for reduction to be completed and less pain during reduction compared to traction-countertraction technique. Furthermore, this method also has less pain during reduction even though without use of intravenous analgesic.

The FARES method is a fast, reliable, and safe way to reduce anterior glenohumeral dislocations. Reduction is performed by one physician, without the need to use analgesics or anesthesia. This method has been proven to be effective and has not been accompanied by complications. Moreover, it appears to be less painful and is faster than other methods of reducing glenohumeral dislocations. It can also be applied to patients with anterior glenohumeral dislocation who also have a fracture of the greater tuberosity (Sayegh et al., 2012).

Although in 2009, a prospective randomized study showed the FARES method to be significantly more effective, faster, and less painful for the reduction of

anterior glenohumeral dislocations in comparison with the Hippocratic and Kocher methods, the number of evidence of FARES method effectiveness in management of acute anterior shoulder dislocation are still limited. Therefore, this study aimed to build a systematic review based on recent researches of effectiveness of FARES method as a new reduction technique in management of acute anterior shoulder dislocation since it invented in 2009 by F. Sayegh et al.

MATERIAL AND METHODS

Search strategy

This systematic review was conducted based on PRISMA guideline. Literature research was primarily performed using the Pubmed, EMBASE, and Cochrane Library to search for studies about effectiveness of FARES method in management of acute anterior shoulder dislocation to November 23rd, 2019 with the keywords "FARES " OR "Fast Reliable Safe" AND "Method" OR “technique” OR “Closed Reduction” AND "anterior shoulder dislocation" OR "acute shoulder dislocation". We filtered the search to include only studies in human, published in the last 10 years, and ones written in English. After that, we combed through all articles cited and citing the articles so as not to miss any relevant articles.

Inclusion criteria

The inclusion criterias were study with acute anterior shoulder dislocation with intervention of FARES method alone or FARES method that compared to other techniques with outcome of VAS, success rate, time of reduction and complication after reduction. Case report and case series were excluded. Given the limited number of studies, there was no restriction in terms of patient’s demographics, though case reports and literatures not in English were excluded.

Table 1. Inclusion and Exclusion Criteria of The Study

Criteria	Inclusion	Exclusion
Population	Patient with anterior shoulder dislocation	Patient with anterior shoulder dislocation with fracture that needs surgical intervention
Intervention	FARES technique	Closed reduction technique other than FARES technique
Comparison	No FARES technique (Placebo) or Other closed reduction technique for anterior shoulder dislocation	Reduction of the shoulder joint with surgical intervention
Outcome	VAS, Reduction Time, Succes rate of FARES technique	Complication of closed reduction that needs surgical intervention

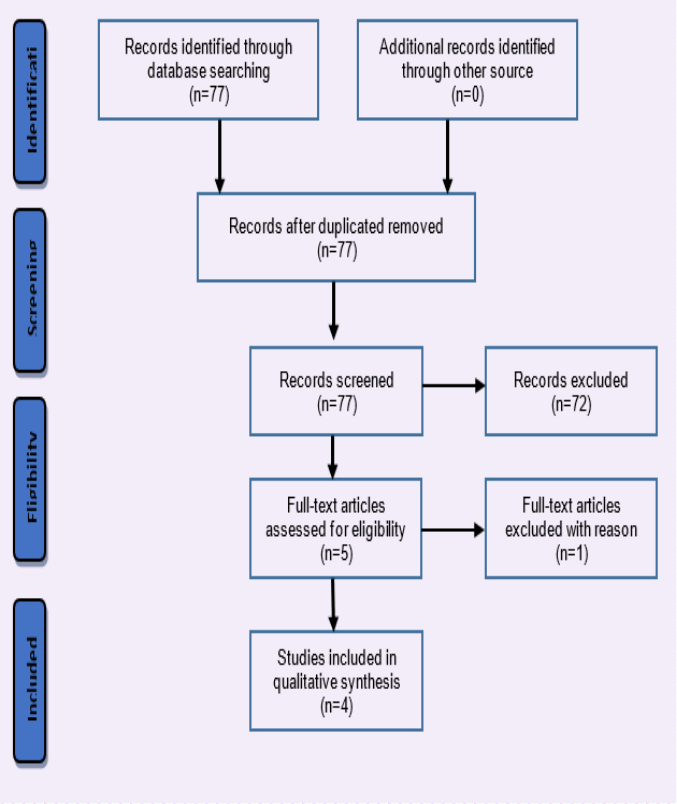

Figure 1. Flow diagram describing the strategy for conducting this study based on PRISMA guideline.

Quality evaluation

First, all authors (KKAM and MBK) screened eligible studies through the titles and abstracts based on inclusion criteria. Then, all authors (KKAM and MBK) screened the full articles of all the collected studies. The authors had a meeting and agreed on highly relevant publications to be included in this study. All authors (KKAM and MBK) performed appraisal of study quality independently and any disagreement was resolved through discussion.

All inherent aspects of the studies, including study quality, variables for which data were sought, and assessment of risk of bias, were appraised by all authors independently by filling up forms. The forms were collected by the first author (KKAM) and the contents were scanned for any disagreement by second author (MBK). The authors then gathered again for discussing any contradicting points.

RESULTS

The electronic search resulted in 77 records, after elimination of duplicate results. On the basis of titles and abstracts screening, a total of 72 records were excluded. The remaining articles were subsequently studied by two independent investigators based on the full text extracted. A list of inclusion and exclusion criteria previously agreed by the authors were utilized for screening the full text. One article excluded from full text article assessed because of the article did not match with inclusion criteria. This selection process yielded 4 final

articles to be included in the systematic review and was depicted in Figure 1.

From 4 articles, 2 articles were prospective randomized controlled trial study (level I of evidence) and 2 articles were descriptive case series and prospective study (level III and IV of evidence) respectively (Table 1) and, in total, 503 patients were eventually included in the analysis. Among these patients, more than 322 patients of anterior shoulder dislocation were treated with FARES method, while 181 patients were treated with other technique including Kocher, Hippocratic and Eachempati external rotation method. The mean age of the samples ranges from 18-75 years old, and male counts for the majority of samples (Table 2).

Table 1. Characteristic Study Included in The Study

No	Reference	Journal	Study Design	Level of Evidence
1	Fares et al., 2009	The Journal of Bone and Joint Surgery	Prospective Randomized Controlled Trial study	Level I
2	Maity et al., 2012	Injury (Elsevier)	Prospective Randomized Controlled Trial study	Level I
3	Vasudevan et al., 2015	International Journal of Research in Medical Sciences	A Descriptive Case Series	Level IV
4	Chamseddine et al., 2019	International orthopaedics	A Prospective Study	Level III

Characteristic of reduction outcome included in this systematic review were VAS, reduction time, success rate of reduction in first attempt and complication during this method. FARES method in most article result in VAS < 2 with FARES method. Reduction time of FARES method ranging from 0.5 – 2.5 minutes. All articles show good success rate of reduction in first attempt with FARES method ranging from 75%-92.54%. There is no any complication obtained after anterior shoulder dislocation reduction with FARES method (Table 3).

Two articles of this study mentioned comparation of FARES method with other techniques. Fares et al (2009) show comparation of FARES method with Kocher and Hippocratic method. VAS during reduction of FARES, Kocher and Hippocratic method are 1.57 ± 1.43, 5.44 ± 1.92 and 4.88 ± 2.17 respectively. Reduction time needed for the reduction with FARES, Kocher and Hippocratic method are 2.36 ± 1.24 minutes, 4.32 ± 2.12 minutes and 5.55 ± 1.58 minutes respectively. Success rate of FARES method in this study was 88.7% while Kocher and Hippocratic method were 68% and 72.5% respectively. There is no any post-reduction complication found in any group of this study.

Maity et al (2012) show comparation of FARES method with Eachempati external rotation method. This study found that the VAS during reduction of FARES method and Eachempati external rotation method were 1.59±0.96 and respectively. Reduction time needed for reduction of FARES method and Eachempati external rotation method in this study were 2.16±0.96 minutes and 3.24 ± 1.13 minutes. Success rate of first attempt of reduction found in this study were 86% and 53% for FARES method and Eachempati external rotation method respectively. There is no any post-reduction complication found in any group of this study (Table 4).

Table 2. Characteristic of Patient Treated with FARES Method

No	Reference	Total Sample Size	Reduction Techniques		Age	Gender	
			FARES method	Other techniques		Male	Female
1	Fares et al., 2009	154	53	101	41.2 ± 17.8 y.o	121	33
2	Maity et al., 2012	160	80	80	36.79±9.12 y.o	130	30
3	Vasudevan et al., 2015	161	161	0	18-75 y.o	131	30
4	Chamseddine et al., 2019	28	28	0	Mean age 37.14 (14-75) y.o	17	11

Table 3. Outcome of FARES Method

No	Reference	Outcome Measure			Complication
		VAS	Reduction Time	Succes rate of reduction in fisrt attemp	
1	Fares et al., 2009	1.57 ± 1.43	2.36 ± 1.24 minutes	47/53 (88.7%)	Without complication
2	Maity et al., 2012	1.59±0.96	2.16±0.96 minutes	86% (65/76)	Without complication
3	Vasudevan et al., 2015	1.78±0.97	1.42 mins±31 seconds	92.54% (149/161)	Without complication
4	Chamseddine et al., 2019	5.29 (range 3 to 8)	62.66 seconds (range 30 to 120 seconds)	75% (21/28)	Without complication

Table 4: Comparison of Effectiveness of FARES method with Other Technique

No	Reference	Outcome	Techniques			
			FARES	Kocher	Hippocratic	Eachempati external rotation
1	Fares et al., 2009	VAS	1.57 ± 1.43	5.44 ± 1.92	4.88 ± 2.17	N/A
		Reduction Time	2.36 ± 1.24 minutes	4.32 ± 2.12 minutes	5.55 ± 1.58 minutes	N/A
		Succes rate	47/53 (88.7%)	34/50 (68%)	37/51 (72.5%)	N/A
2	Maity et al., 2012	VAS	1.59±0.96	N/A	N/A	3.38±1.61
		Reduction Time	2.16±0.96 minutes	N/A	N/A	3.24 ± 1.13 minutes
		Succes rate	86% (65/76)	N/A	N/A	39/73 (53 %)

DISCUSSION

Shoulder dislocation is the most common large joint dislocation in the body, with an incidence of 1.7%1 or 8.2–17 per 100 000 per year. Practitioners should be aware of the potential complications and risks of different reduction techniques and that they know a safe technique that they are confident in performing (Gottlieb et al., 2016). There are several methods of reduction of the anterior dislocation of the shoulder, including those introduced by Hippocrates, Kocher, Milch, and Stimpson. The optimum method of reduction should require minimum assistance for the physician performing it, and it should be highly effective, quick, safe, and relatively painless .

This systematic review concern about effectiveness of fast, reliable and safe (FARES) method as a new reduction technique for management of acute anterior shoulder dislocation. The author found 4 articles for this systematic review which are 2 articles were prospective randomized controlled trial study (level I of evidence) and 2 articles were descriptive case series and prospective study (level III and IV of evidence) respectively. All articles show good result of FARES method with no complication reported.

Characteristic of reduction outcome included in this systematic review were VAS, reduction time, success rate of reduction in first attempt and complication during this method. FARES method in most article result in VAS < 2 with FARES method. Reduction time of FARES method ranging from 0.5 – 2.5 minutes. All articles show good success rate of reduction in first attempt with FARES method ranging from 75%-92.54%. Two articles of this study that mentioned comparation of FARES method with other technique show that FARES method is superior compare to Kocher method, Hippocratic method and Eachempati method in with less VAS, less reduction time needed and higher success rate of reduction technique (Chamseddine et al., 2019; Maity, Roy, & Mondal, 2012; Sayegh et al., 2009; Vasudevan, Ramlal, & Samraj, 2015).

A systematic comparison of closed shoulder reduction techniques by Alkaduhimi et al (2017) show the comparison of FARES technique with other closed shoulder reduction technique. This study found that FARES technique have less pain during reduction and less reduction time needed compare to Kocher, Spaso, Milch, Chair, Traction counter-traction, Stimpson and Hippocratic technique. In the reduction success rate, FARES method is superior compare to Kocher, Spaso, Milch, Chair, Stimpson and Hippocratic technique. This study found that FARES method is better than scapular technique and traction counter-traction technique because of in FARES method there is no analgesic needed during reduction (0%) while the percentage of patients receiving analgesics was 100% for the scapular manipulation (pethidine and midazolam) and 38% for the traction countertraction (intravenous sedation) (Alkaduhimi et al., 2017).

Even this systematic review show consistent result of effectiveness of FARES method, there are still several limitation of this study. First, this study only find 4 articles and only 2 articles that has level 1 of evidence. The author recommends any further study of effectiveness of FARES method with better level of evidence so the orthopedic surgeon has future new choice of anterior shoulder closed reduction technique with good evidence based. Second, the authors could not found any data of mean hospital stay and follow up period after FARES method application. This data is essential to know the outcome after application of this method holistically.

CONCLUSION

This systematic review reports successful outcome of FARES method application in patient with anterior shoulder dislocation and this method could be promising technique in current treatment of anterior shoulder dislocation. However, it has been about > 10 years after the first paper of FARES technique firstly reported in 2009 but the author found lack of any strong evidence based study to have strong recommendation of the effectiveness of this method. There is still needs to do further study of effectiveness of FARES method with high level of evidence to make FARES method a good evidence based technique.

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