

First time Anterior Shoulder Dislocation: Rationale for Treatment

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Abstract

Anterior traumatic glenohumeral joint dislocation is the most common dislocation in the human body. The definitive management of first-time anterior shoulder dislocation remains controversial. The traditional conservative treatment of closed reduction and immobilisation has shown high recurrence rates in the young athletic male population involved in contact sports. This has led to an increased interest and trend amongst shoulder surgeons to offer early operative stabilisation after first dislocation itself. This article reviews current literature about recurrence rates after conservative versus operative treatment of first time shoulder dislocation. It also highlights key issues of defining the high risk group for recurrence after conservative treatment, compares the outcomes of surgery for first versus recurrent shoulder dislocations and also mentions complications of early surgery. Article also discusses an evidenced based treatment algorithm for the treatment of a first time anterior shoulder dislocation.

Keywords: dislocation, rationale, anterior.

Introduction

The glenohumeral joint is the most mobile articulation in the body and the most commonly dislocated diarthroidal joint. Anterior traumatic dislocation of the shoulder represents 96% of all shoulder dislocations[1]. This instability of the glenohumeral joint ranges from subtle increased laxity to recurrent dislocation.

The definitive management of first-time anterior shoulder dislocation (FTASD) remains controversial. Traditionally, treatment consisted of initial immobilization, ranging from four to six weeks, followed by intensive functional rehabilitation. However, in view of the high recurrence rates associated with this approach, there has been an interest in determining whether immediate surgical intervention is able to lower the rate of recurrent shoulder dislocation and to

improve the patient's quality of life.

Malhotra et al in their study comprehensively surveyed all members of the British Elbow and Shoulder Society (BESS) to determine their preferred methods of treating young patients with traumatic, anterior shoulder dislocation once in 2002 and later in 2009 and found that the numbers who now potentially offer stabilization surgery to FTASD virtually doubled from 35% to 68%. This increase in surgical treatment is due to the studies supporting arthroscopic bankarts repair (ABR) over conservative treatment when it comes to decreased risk of recurrence[2].

This article critically reviews available literature about recurrence rates after conservative treatment of FTASD and the superiority of ABR over conservative treatment modality for the same.

In this review article we decided to answer the following questions :-

1. What is the definition of "high risk groups" when it comes to incidence and high recurrence of anterior shoulder dislocation?
2. What are the recurrence rates after conservative treatment of first time

shoulder dislocator?

3. Are the recurrence rates significantly different after surgical treatment of first-time anterior shoulder dislocation compared to recurrent shoulder (≥ 2 dislocations)?

4. What are the widely accepted management modalities and the recent evidence to support the same?

Pathology

Approach to a young patient with FTASD should be broadly classified into 2 groups based on the etiology namely

1) traumatic and 2) atraumatic

During traumatic anterior dislocation, the humeral head is displaced in an anteroinferior manner; thus stretching the capsuloligamentous components, often resulting in a "essential lesion" termed as a Bankart lesion [3]. Other lesions that may be associated with traumatic anterior dislocations include Hill-Sachs lesions, superior labral tears from anterior to posterior (SLAP), capsular tears, rotator cuff tears and glenoid rim fractures[4].

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contact or collision sports, or who required overhead occupational use of the arm, were more likely to have re-dislocation of the shoulder than their less active peers, or older patients. However, even in the highest-risk group, only approximately half of the patients with shoulder re-dislocation requested for surgical treatment within the follow-up period. Thus, they concluded an early surgery based on the presumption of future dislocations, unhappiness and disability was not justified through this study[5].

Overall recurrence after ABR is low but it is not that far behind of conservative treatment.

Chapus et al performed a prospective study with a Ten-year follow-up of acute arthroscopic Bankart repair for initial anterior shoulder dislocation in young patients less than 25 years of age and found a recurrence rate of 35% [23]. Linde et al in a study showing Long-term results after arthroscopic shoulder stabilization in an 8- to 10-year follow-up reported a re-dislocation rate of 35%. The presence of a Hill-Sachs defect and the use of less than 3 suture anchors showed to increase the chance of recurrence [24]. Flinkkila et al investigated the long-term results of arthroscopic Bankart repair over a minimum of 10 years followup and Nearly 30% of patients had recurrence of instability after arthroscopic Bankart repair. Patients aged ≤ 20 years did poorly with nearly 54% of the patients having recurrence. It was advocated that alternative stabilization techniques should probably be considered for these patients.

Thus the re-dislocation rates after ABR in the available literature are ranging between 3% and 41% [24,25,26].

The real comparison should be between the recurrence rate in cases of ABR done for FTASD and that for ≥ 2 dislocations.

Panzram et al in a retrospective study published the mid-term to long-term results of primary ABR for traumatic

anterior shoulder instability. In the study patients who sustained only one episode of subluxation/dislocation prior surgery (group A) had a recurrence rate of 21% as compared to group B (22% recurrence rate) which includes patients with more than one episode, thus showing that ABR after multiple dislocations does not significantly affect the outcome. However, those patients with more than 5 episodes of dislocation prior to surgery showed a recurrence rate of as high as 35% [27]. In another study, marshal et al studied the outcomes after ABR in Patients with first-time versus recurrent dislocations found that postoperative instability rate was 29% in the first-time dislocation group and 62% in the recurrent dislocation group [28].

From these studies, it seems that operative treatment for a FTASD in a young population may reduce recurrence, improve outcome, and avoid the frequent necessity of open reconstructive procedures in patients who suffer from recurrent instability and concomitant glenoid bone loss. Although the rate of recurrence is high in the young active population, it is not unacceptably high. A sizable number of patients may be treated surgically unnecessarily leading to "over treatment". There is calculated risk if one offers conservative treatment after first dislocation and remains vigilant for subsequent recurrence.

If all FTASD are operated upon, then to prevent one patient from sustaining a redislocation, 4.7 patients would need to be operated and subjected to a risk of operative complications which can easily be avoided by a conservative trial, as quoted by Robinson et al [6].

Complications occurring after surgery can delay or hinder return to athletic activity. Common issues after shoulder stabilization procedure include nerve injury, chondrolysis, hardware failure, decreased strength or range of motion, persistent pain, degenerative arthritis, infection, and subscapularis

dysfunction [29]. Further Pelet et al. found that Bankart procedure does not prevent the development of glenohumeral degenerative arthritis [30].

Role of open procedures/ Latarjet procedure

An arthroscopic-only Bankart should be planned only if Glenoid bone loss is $< 15\%$, and humeral head lesions are "on track". If there is greater bone loss, adjunct or open procedures should be performed [31].

A systematic review study to compare the outcomes of Bankart repairs vs. the open Latarjet procedure for recurrent instability of the shoulder demonstrated that the Latarjet procedure is a viable and possibly superior alternative to the Bankart repair, offering greater stability for recurrent instability of the shoulder [32]. Hardy et al in their study concluded that the number of episodes of dislocation before surgery does not affect postoperative instability rates and reoperation rates after the Latarjet procedure. The rates of recurrence were 4.8% in the first-time dislocation group versus 3.65% in the recurrent dislocation group [33]. Blonna et al compared in a case control-matched manner the 2 techniques of ABR and open bristow-latarjet procedure with particular emphasis on return to sport after surgery and concluded that ABR using anchors provided better return to sport and subjective perception of the shoulder compared with the open Bristow-Latarjet procedure in the population studied. Recurrence, however was higher in the ABR group [34].

Latarjet procedure is indicated in cases of high risk group with significant glenoid bone loss, and recurrent instability after failed ABR treatment.

Consensus from Neer Circle of ASES:

The considerable controversy with regards to the treatment of FTASD is true even among surgeons with considerable experience in the field. The following

Atraumatic shoulder dislocations usually present with ligamentous laxity, have bilateral presentations with midrange instability and are treated conservatively with shoulder rehabilitation.

Risk factors for recurrent shoulder instability

Extrinsic risk factors of recurrent shoulder instability include overhead athletes [5], athletes in collision sport [6] or military personnel [7]. Intrinsic risk factors include hypermobility [8,9,10] and age [11].

Young age and male sex are frequently identified as risk factors for recurrent instability [6]. However, definition of young is not well defined in these literatures. Some studies mention <20 years as young while others classify <30 years as young and having a high risk for recurrence of shoulder dislocation.

In patients younger than 20 years of age, recurrent dislocation rates have been reported as high as 90% in the athletic population. The rate of recurrence drops to between 50% and 75% in patients 20 to 25 years of age [12,13,14].

Studies have shown that the lower limit in adolescents predisposing to highest rate of recurrence is set at 14 years [15].

The general trend of recurrence goes on decreasing as we go higher in age groups. In patients older than 40 years, anterior dislocation is associated with lower rates of instability, but high rates of rotator cuff tears. The incidence of rotator cuff tears in patients older than 40 years at the time of initial dislocation is 15% and the incidence climbs to 40% in patients older than 60 years of age [14].

Emergency management

Acute traumatic shoulder dislocations commonly presents in the emergency room. Detailed history-taking and clinical examination especially for confirming neuro vascular status both before and after attempting reduction is of paramount importance in order to rule out axillary nerve, brachial plexus or

isolated nerve injury [16]. Radiological assessment with 2 orthogonal radiographs will confirm the diagnosis and help to identify associated fractures before attempting reduction. There is no consensus about the technique of closed reduction, but gentle attempt at closed reduction under painkiller cover is advised. It is recommended that closed reduction should be done under short general anesthesia with adequate muscle relaxation to avoid iatrogenic soft tissue and bony injuries.

Post reduction clinical examination and radiographs are mandatory to confirm successful reduction. Post reduction true anteroposterior view of the shoulder is very important to avoid missing any associated fractures of greater tuberosity, bony bankarts or Hill Sachs lesion. In case of associated bony injuries or immediate recurrence of instability following closed reduction, further investigations in the form of CT scan and MRI are advisable. Bony bankart or glenoid bone loss should not be missed and should be tackled surgically in order to avoid unacceptable recurrence rates [17]. After closed reduction of a glenohumeral dislocation, patients are placed in a simple shoulder sling in internal rotation traditionally. Some recent reports, have suggested that immobilization in a position of humeral external rotation may result in a lower rate of recurrence compared with traditional immobilization in internal rotation, but may cause issues with compliance owing to the discomforting position of the upper extremity [18,19].

Role of conservative treatment

A prospective multicenter study of 25 years follow-up by Hovelius et al [13] found that 43% of the patients aged 12 to 40 with a primary anterior shoulder dislocation who had been treated nonoperatively either had not re-dislocated or had become stable over time. They concluded from these findings that immediate surgery for the

treatment of all FTASD aged 25 years or younger would result in a rate of unnecessary operations of at least 30%, or possibly 50% if one considers the number of shoulders that became stable over time. In another study, the natural history of 131 first-time dislocators revealed that approximately half had no additional instability event within a 5-year follow-up period, and the other half had 1 or more redislocations [5]. Robinson et al performed a prospective cohort study of 252 patients ranging from 15 to 35 years old who sustained an anterior glenohumeral dislocation and were treated with sling immobilization, followed by a physical therapy program. They found that instability developed in 55.7% of the shoulders within the first two years after the primary dislocation and increased to 66.8% by the fifth year. The younger male patients were most at risk of instability [3].

Conservative treatment conferred a recurrence rate of over 50% which is still relatively high and hence some researchers have investigated the role of arthroscopic treatment in first-time shoulder dislocations.

Role of arthroscopic stabilization for ftasd

Arciero and colleagues reported a 14% failure in the operatively treated group compared with an 80% failure rate in the nonoperative group [20]. Several other studies reported significantly lower recurrence rates following arthroscopic Bankart repair when compared with nonoperative treatment. Additionally, patients treated surgically demonstrated a superior outcome compared with the nonoperative group using a quality of life assessment [21,22].

Sachs et al tried to identify patients at high risk for recurrence and whether these high-risk patients were best served by immediate surgical stabilization by prospectively following up on 131 patients for five years. They found that younger patients who were involved in

conclusions were derived from the first consensus process of the Neer Circle of the American Shoulder and Elbow Surgeons on treatment of the patient with a FTASD [35].

1. Experts do not believe that surgery should be a standard for all patients with first time dislocations.

2. Contact athletes, at the end of their competitive season, age >14 with apprehension and meaningful bone loss had very high levels of recommending surgery (>90%) with very strong recommendations to do so.

3. Non-athletes of all ages without apprehension, and without meaningful bone loss had extremely low levels of surgical recommendation (<6%), with

very strong recommendations against surgery.

4. Patient features that strongly influenced surgery were meaningful bone loss and apprehension.

5. Age followed a distribution such that <14 and >30 years old were less likely to have surgery

Authors Opinion and conclusion:

After considering all the available literature, the author feels that non-operative treatment still remains the first treatment option for FTASD in majority of patients.

In cases associated with greater tuberosity fracture, bony bankarts or in high-risk individuals (overhead and contact

sport athletes and military personnel) within the age group of 14-30 years the option of surgical stabilization should be offered as a viable option owing to the relatively high recurrence rate in such patients after conservative treatment. At the same time decision of surgery should be individualized and jointly taken after adequate counselling and discussion regarding benefits and complications of the procedure with the patient, parents and coach.

References

- Goss TP. Anterior glenohumeral instability. *Orthopedics*. 1988.
- Malhotra A, Freudmann MS, Hay SM. Management of traumatic anterior shoulder dislocation in the 17- to 25-year age group: A dramatic evolution of practice. *J Shoulder Elb Surg [Internet]*. 2012 Apr 1 [cited 2021 Mar 1];21(4):545–53. Available from: <http://www.jshoulderelbow.org/article/S1058274611000073/fulltext>
- Robinson CM, Howes J, Murdoch H, Will E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. *J Bone Jt Surg - Ser A [Internet]*. 2006 Nov [cited 2021 Feb 24];88(11):2326–36. Available from: <https://pubmed.ncbi.nlm.nih.gov/17079387/>
- Arciero RA, Boone JL. First-time anterior shoulder dislocations: Has the standard changed? *Br J Sports Med [Internet]*. 2010 Apr [cited 2021 Mar 1];44(5):355–60. Available from: <https://pubmed.ncbi.nlm.nih.gov/20371561/>
- Sachs RA, Stone M Lou, Paxton E, Kuney M, Lin D. Can the Need for Future Surgery for Acute Traumatic Anterior Shoulder Dislocation Be Predicted? *J Bone Jt Surg [Internet]*. 2007 Aug [cited 2021 Feb 19];89(8):1665–74. Available from: <http://journals.lww.com/00004623-200708000-00001>
- Robinson CM, Howes J, Murdoch H, Will E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. *J Bone Jt Surg - Ser A*. 2006;
- Owens BD, Dawson L, Burks R, Cameron KL. Incidence of shoulder dislocation in the United States military: Demographic considerations from a high-risk population. *J Bone Jt Surg - Ser A [Internet]*. 2009 Apr 1 [cited 2021 Feb 19];91(4):791–6. Available from: <https://pubmed.ncbi.nlm.nih.gov/19339562/>
- Møller AM, Villebro N, Pedersen T, Tønnesen H. Effect of preoperative smoking intervention on postoperative complications: A randomised clinical trial. *Lancet*. 2002 Jan 12;359(9301):114–7.
- Arciola CR, Montanaro L, Moroni A, Giordano M, Pizzoferrato A, Donati ME. Hydroxyapatite-coated orthopaedic screws as infection resistant materials: In vitro study. *Biomaterials*. 1999 Feb;20(4):323–7.
- Chahal J, Leiter J, McKee MD, Whelan DB. Generalized ligamentous laxity as a predisposing factor for primary traumatic anterior shoulder dislocation. *J Shoulder Elb Surg [Internet]*. 2010 Dec [cited 2021 Feb 19];19(8):1238–42. Available from: <https://pubmed.ncbi.nlm.nih.gov/20452244/>
- Kralinger FS, Golser K, Wischatta R, Wambacher M, Sperner G. Predicting Recurrence after Primary Anterior Shoulder Dislocation. *Am J Sports Med [Internet]*. 2002 Jan 30 [cited 2021 Feb 19];30(1):116–20. Available from: <http://journals.sagepub.com/doi/10.1177/03635465020300010501>
- Hovellius L. Anterior dislocation of the shoulder in teen-agers and young adults. Five-year prognosis. *J Bone Jt Surg - Ser A*. 1987;
- Hovellius L, Augustini BG, Fredin H, Johansson O, Norlin R, Thorling J. Primary Anterior Dislocation of the Shoulder in Young Patients. *J bone Jt Surg*. 1996;
- Henry JH, Genung JA. Natural history of glenohumeral dislocation—revisited. *Am J Sports Med [Internet]*. 1982 [cited 2021 Feb 19];10(3):135–7. Available from: <https://pubmed.ncbi.nlm.nih.gov/7114346/>
- Olds M, Donaldson K, Ellis R, Kersten P. In children 18 years and under, what promotes recurrent shoulder instability after traumatic anterior shoulder dislocation? A systematic review and meta-analysis of risk factors. *British Journal of Sports Medicine*. 2016.
- Robinson CM, Dobson RJ. Anterior instability of the shoulder after trauma [Internet]. Vol. 86, *Journal of Bone and Joint Surgery - Series B*. *J Bone Joint Surg Br*; 2004 [cited 2021 Mar 1]. p. 469–79. Available from: <https://pubmed.ncbi.nlm.nih.gov/15174539/>
- Griffith JF, Antonio GE, Yung PSH, Wong EMC, Yu AB, Ahuja AT, et al. Prevalence, pattern, and spectrum of glenoid bone loss in anterior shoulder dislocation: CT analysis of 218 patients. *Am J Roentgenol [Internet]*. 2008 May [cited 2021 Mar 1];190(5):1247–54. Available from: <https://pubmed.ncbi.nlm.nih.gov/18430839/>

18. Itoi E, Hatakeyama Y, Kido T, Sato T, Minagawa H, Wakabayashi I, et al. A new method of immobilization after traumatic anterior dislocation of the shoulder: A preliminary study. *J Shoulder Elb Surg* [Internet]. 2003 [cited 2021 Feb 19];12(5):413–5. Available from: <https://pubmed.ncbi.nlm.nih.gov/14564258/>
19. Atlas SJ, Keller RB, Wu YA, Deyo RA, Singer DE. Long-term outcomes of surgical and nonsurgical management of lumbar spinal stenosis: 8 to 10 year results from the Maine lumbar spine study. *Spine (Phila Pa 1976)*. 2005 Apr 15;30(8):936–43.
20. Arciero RA, Wheeler JH, Ryan JB, McBride JT. Arthroscopic Bankart Repair Versus Nonoperative Treatment for Acute, Initial Anterior Shoulder Dislocations. *Am J Sports Med* [Internet]. 1994 [cited 2021 Feb 24];22(5):589–94. Available from: <https://pubmed.ncbi.nlm.nih.gov/7810780/>
21. Bottoni CR, Wilckens JH, DeBerardino TM, D'Alleyrand JCG, Rooney RC, Harpstrite JK, et al. A prospective, randomized evaluation of arthroscopic stabilization versus nonoperative treatment in patients with acute, traumatic, first-time shoulder dislocations. *Am J Sports Med* [Internet]. 2002 [cited 2021 Feb 24];30(4):576–80. Available from: <https://pubmed.ncbi.nlm.nih.gov/12130413/>
22. Kirkley A, Griffin S, Richards C, Miniaci A, Mohtadi N. Prospective randomized clinical trial comparing the effectiveness of immediate arthroscopic stabilization versus immobilization and rehabilitation in first traumatic anterior dislocations of the shoulder. *Arthrosc - J Arthrosc Relat Surg* [Internet]. 1999 [cited 2021 Feb 24];15(5):507–14. Available from: <https://pubmed.ncbi.nlm.nih.gov/10424554/>
23. Chapus V, Rochcongar G, Pineau V, Salle de Chou, Hulet C. Ten-year follow-up of acute arthroscopic Bankart repair for initial anterior shoulder dislocation in young patients. *Orthop Traumatol Surg Res* [Internet]. 2015 Dec 1 [cited 2021 Feb 24];101(8):889–93. Available from: <https://pubmed.ncbi.nlm.nih.gov/26563924/>
24. Van Der Linde JA, Van Kampen DA, Terwee CB, Dijkman LM, Kleinjan G, Willems WJ. Long-term results after arthroscopic shoulder stabilization using suture anchors: An 8- to 10-year follow-up. *Am J Sports Med* [Internet]. 2011 Nov [cited 2021 Feb 24];39(11):2396–403. Available from: <https://pubmed.ncbi.nlm.nih.gov/21803980/>
25. Aboalata M, Plath JE, Seppel G, Juretzko J, Vogt S, Imhoff AB. Results of Arthroscopic Bankart Repair for Anterior-Inferior Shoulder Instability at 13-Year Follow-up. *Am J Sports Med* [Internet]. 2017 Mar 1 [cited 2021 Feb 24];45(4):782–7. Available from: <https://pubmed.ncbi.nlm.nih.gov/27872125/>
26. Castagna A, Markopoulos N, Conti M, Delle Rose G, Papadakou E, Garofalo R. Arthroscopic bankart suture-anchor repair: Radiological and clinical outcome at minimum 10 years of follow-up. *Am J Sports Med* [Internet]. 2010 Oct [cited 2021 Feb 24];38(10):2012–6. Available from: <https://pubmed.ncbi.nlm.nih.gov/20595552/>
27. Panzram B, Kentar Y, Maier M, Bruckner T, Hetto P, Zeifang F. Mid-Term to long-Term results of primary arthroscopic Bankart repair for traumatic anterior shoulder instability: A retrospective study. *BMC Musculoskelet Disord* [Internet]. 2020 Mar 27 [cited 2021 Feb 24];21(1):191. Available from: <https://bmc-musculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-020-03223-3>
28. Henry C. Pin sites: Do we need to clean them? *Pract Nurs*. 1996 Mar;7(4):12–7.
29. Kang RW, Frank RM, Nho SJ, Ghodadra NS, Verma NN, Romeo AA, et al. Author's personal copy Current Concepts Complications Associated With Anterior Shoulder Instability Repair. *Arthrosc J Arthrosc Relat Surg*. 2009;25(8):909–20.
30. Pelet S, Jolles BM, Farron A. Bankart repair for recurrent anterior glenohumeral instability: Results at twenty-nine years' follow-up. *J Shoulder Elb Surg* [Internet]. 2006 Mar [cited 2021 Feb 24];15(2):203–7. Available from: <https://pubmed.ncbi.nlm.nih.gov/16517366/>
31. Levy BJ, Grimm NL, Arciero RA. When to Abandon the Arthroscopic Bankart Repair: A Systematic Review [Internet]. Vol. 12, *Sports Health*. SAGE Publications Inc.; 2020 [cited 2021 Feb 25]. p. 425–30. Available from: <https://pubmed.ncbi.nlm.nih.gov/32716726/>
32. An VVG, Sivakumar BS, Phan K, Trantalis J. A systematic review and meta-analysis of clinical and patient-reported outcomes following two procedures for recurrent traumatic anterior instability of the shoulder: Latarjet procedure vs. Bankart repair. *J Shoulder Elb Surg* [Internet]. 2016 May 1 [cited 2021 Feb 25];25(5):853–63. Available from: <https://pubmed.ncbi.nlm.nih.gov/26809355/>
33. Hardy A, Sabatier V, Laboudie P, Schoch B, Nourissat G, Valenti P, et al. Outcomes After Latarjet Procedure: Patients With First-Time Versus Recurrent Dislocations. *Am J Sports Med* [Internet]. 2020 Jan 1 [cited 2021 Mar 4];48(1):21–6. Available from: <https://pubmed.ncbi.nlm.nih.gov/31647689/>
34. Blonna D, Bellato E, Caranzano F, Assom M, Rossi R, Castoldi F. Arthroscopic Bankart Repair Versus Open Bristow-Latarjet for Shoulder Instability: A Matched-Pair Multicenter Study Focused on Return to Sport. *Am J Sports Med*. 2016;
35. Tokish JM, Kuhn JE, Ayers GD, Arciero RA, Burks RT, Dines DM, et al. Decision making in treatment after a first-time anterior glenohumeral dislocation: A Delphi approach by the Neer Circle of the American Shoulder and Elbow Surgeons. *J Shoulder Elb Surg* [Internet]. 2020 Dec 1 [cited 2021 Feb 25];29(12):2429–45. Available from: <https://pubmed.ncbi.nlm.nih.gov/32858192/>

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