

REVIEW ARTICLE

MANAGEMENT OF THE FIRST-TIME ANTERIOR SHOULDER DISLOCATION. ANALYSIS OF A SURVEY CONDUCTED AMONG MEMBERS OF THE POLISH SHOULDER AND ELBOW SOCIETY

POSTĘPOWANIE W PRZYPADKU PIERWSZEGO PRZEDNIEGO ZWICHNIĘCIA STAWU RAMIENNEGO. ANALIZA ANKIETY PRZEPROWADZONEJ WŚRÓD CZŁONKÓW POLSKIEGO TOWARZYSTWA BARKU I ŁOKCIA

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ABSTRACT

There is a very large discrepancy when it comes to the management of the first-time anterior shoulder instability (FTASD) among orthopaedic surgeons all over the world. Such discrepancies have been also observed in Poland regarding the management after FTASD, hence an attempt was made to introduce recommendations and standardize the procedures. Guidelines of management after FTASD in European countries have been introduced so far in the UK and the Netherlands, which resulted in a change of behavior. The authors of the recommendations were committed to expanding the knowledge about FTASD and implementing in Poland the most effective model of management. The aim of this study is to present and discuss the results of a survey conducted among members of the Polish Shoulder and Elbow Society (PSES) on diagnostics, conservative and surgical treatment in the case of FTASD. The results of this survey, together with the results of the conducted DELPHI study, will be used to develop recommendations of the PSES for the management of FTASD.

Keywords: first-time anterior shoulder dislocation, recommendations, shoulder instability

STRESZCZENIE

Postępowanie po pierwszorazowym zwicnięciu stawu ramiennego (PZSR) cechuje się znaczną różnorodnością wśród ortopedów na całym świecie. W Polsce, również obserwujemy odmienności w postępowaniu przy tym urazie, stąd podjęte zostały wysiłki by wprowadzić rekomendacje ujednolicające postępowanie. Wytyczne postępowania przy PZSR w Europie wprowadzone zostały do tej pory w Wielkiej Brytanii oraz Holandii, co skutkowało zmianą przyzwyczajzeń chirurgów i lekarzy medycyny ratunkowej. Autorzy rekomendacji zobowiązali się do poszerzenia świadomości na temat PZSR oraz do wprowadzenia w Polsce najefektywniejszego modelu postępowania.

Celem tej pracy jest przedstawienie i przedyskutowanie wyników ankiety przeprowadzonej wśród członków Polskiego Towarzystwa Barku i Łokcia (PTBŁ) na temat diagnostyki,

leczenie zachowawczego oraz chirurgicznego po PZSR. Wyniki tej ankiety wraz z wynikami przeprowadzonego badania Delphi posłużą do stworzenia wytycznych PTBŁ dla postępowania przy PZSR.

Słowa kluczowe: niestabilność barku, zwichnięcie barku, wytyczne po zwichnięciu barku

Introduction

The first anterior dislocation of the shoulder (FTASD) is an injury that accounts for about 10% of all injuries in this area (Liavaag *et al.* 2011). According to epidemiological studies, the presence of this pathology is estimated at 11: 100 000 to 56: 100 000 per year (Hovelius *et al.* 1982; Liavaag *et al.* 2011; Owens and Agel *et al.* 2009; Owens *et al.* 2009; Zacchilli *et al.* 2010). Young men practicing contact sports such as wrestling, football or hockey are at the greatest risk of dislocation (Liavaag *et al.* 2011; Owens and Agel *et al.* 2009; Zacchilli *et al.* 2010). As a result of dislocation, both soft tissues (labrum, glenohumeral ligaments or rotator cuff tendons), as well as bone structures (anterior glenoid rim, Hill-Sachs lesion), can be damaged. These injuries are the most important risk factor for chronic instability of the shoulder joint, which is a serious orthopedic problem, usually requiring surgery.

The surveys and studies carried out so far have shown that among orthopedists all over the world there is a very large discrepancy when it comes to the management of the FTASD (Owens and Agel *et al.* 2009; Zacchilli *et al.* 2010). Uniform guidelines in European countries have been introduced so far in the Netherlands (Sala *et al.* 2005), which resulted in a change of behavior in almost 30% of orthopedists (Berendes *et al.* 2015). At present, in Poland, there are no uniform standards or developed guidelines for the management of the FTASD and attempts to introduce them are under discussion. Discrepancies in therapeutic procedures are the result of different treatment patterns that prevail in individual centers. Moreover, the variety of dislocation injuries and the expectations of individual patients make it difficult to develop uniform standards of care. The aim of this

study is to present and discuss the results of a survey conducted among members of the Polish Shoulder and Elbow Society (PSES) on diagnostics, conservative and surgical treatment in the case of first-time dislocation of the shoulder. Another aim is to determine the compliance of the respondents on specific issues in relation to the current knowledge available in the literature to determine the usefulness of introducing recommendations. This questionnaire served as the basis for the development of later PSES guidelines on how to proceed after the FTASD.

Methodology and results

The process of creating the questionnaire was developed during the II PSES Congress in Poznań in 2018. A group of experts – members of the society identified issues, the discussion of which was necessary to formulate subsequent recommendations. On their basis, there was created a questionnaire containing 34 questions on diagnosis, treatment, rehabilitation, return to work and sports, and treatment of complications of primary dislocation of the shoulder. This questionnaire was sent to shoulder surgery specialists. They included surgeons working in specialized shoulder surgery centers as well as doctors from multi-profile hospitals who specialize in surgery of the shoulder. For 9 months, the questionnaire was available on the website for all invited surgeons. Out of 58 doctors who received the questionnaire, 29 (50%) answered all the questions, and the answers were summarized in the table (Table 1). The questions were divided into 4 categories: diagnosis and reposition, treatment after reposition and return to activity, qualification for surgical treatment, outpatient

control and treatment of complications. The following analysis is based on the results of this questionnaire based on the 4 question categories mentioned above.

Diagnostics and reposition

The basis for the management of shoulder dislocation is an interview focused on the circumstances of the injury and symptoms reported by a patient, as well as a physical

Table 1. Survey questions with answers.

Question	Question	Answers
Part I – Radiological examinations in the diagnosis of FTASD	Question 1: Should and what radiological diagnostics should be performed in the diagnosis of FTASD	X-ray in AP projection 96.6%, X-ray in Y projection 86.2% X-ray in axial acetabular projection 13.8%
	Question 2: Should and what radiological diagnostics should be performed in diagnostics after reduction of FTASD	X-ray in AP projection 96.6%, X-ray in Y projection 79.3% X-ray in axial acetabular projection 10.3%
	Question 3: What additional imaging tests do you order?	MRI 65.4%, USG 38.5%, CT 34.6%, Arthro MRI 7.7%, Arthro TK 3.8%, I do not use additional tests 11.5%
	Question 4: What kind of anesthesia do you use for attitude?	General anesthesia in adults 89.7%, General anesthesia in children 86.2%, Additional local anesthesia 13.8%, Emergency reposition without anesthesia 51.7%
Part II – Conservative treatment after FTASD	Question 1: What are your treatments after reduction the dislocation	Age 14–17 years: immobilization for 3–4 weeks 41.4%, for 2–3 weeks 27.6%, less than 2 weeks 20.1%, over 4 weeks 6.9% Age 18–39: immobilization for 3–4 weeks 51.7%, immobilization for 2–3 weeks 27.6%, less than 2 weeks 17.2% Age 40–60 years: immobilization for 2–3 weeks 41.4%, immobilization less than 2 weeks 24.1%, without immobilization 17.2%, immobilization for 3–4 weeks 17.2% Age > 60 years: Immobilization less than 2 weeks 37.9%, no immobilization 31%, immobilization 2–3 weeks 17.2%, immobilization 3–4 weeks 13.8%
	Question 2: In what position is the shoulder immobilized if you decide to immobilize after a FTASD?	Immobilization in the adduction position – 48.3%, in neutral rotation 41.4%, in external rotation 10.3%
	Question 3: Do you recommend rehabilitation after primary conservative dislocation?	Yes kinesitherapy – 82.8%, Yes manual therapy – 27.6%, Yes physical therapy – 10.3%, No – 13.8%
	Question 4: How long in months do you allow patients to return to recreational sports?	3 mo 69%, 2 mo 10.3%, 4 mn 10.4 %
	Question 5: How long in months do you allow patients to return to professional sports?	6 mo 44.8%, 3 mo 31%
	Question 6: How long after dislocation do you allow the patient to resume physical work?	3 mo 62.1%, 4 mo 13.8%, 2 mo 13.8 %, 6 mo 6.9%
Part III Surgical treatment after FTASD	Question 1. Do you qualify the patient for surgery with reposition problems?	Yes – 79.3% No – 20.7%
	Question 2: Do you qualify the patient for dislocation recurrence immediately after reposition?	Yes – 89.7% No – 20.3%
	Question 3: Do you qualify for surgery when a fracture of the glenoid is found?	Yes – 72.4%, No – 27.6%
	Question 4: What surgical technique will you use to treat glenoid fracture < 20% of its diameter?	Ages 14–17: Fracture Reposition – 72.4%, Bankart Procedure – 34.3%, Latarjet – 20.1%, Bone-Block Procedure – 3.4% Age 18–25: fracture reposition – 55.2%, Bankart procedure – 44.8%, Latarjet 24.1%, bone-block procedure – 6.9% Age 26–40: bankart procedure – 58.6%, fracture reposition – 41.4%, Latarjet – 27.6%, bone-block procedure – 13.8%. Age > 40 years: Bankart procedure – 65.5%, fracture reposition – 34.5%, bone-block procedure 13.7%, Latarjet – 10.3%

Table 1. (cont.) Survey questions with answers.

Question	Question	Answers
Part III Surgical treat- ment after FTASD	Question 5: What surgical technique will you use to treat glenoid fracture > 20% of its diameter?	Ages 14–17: Fracture Reposition – 89.7%, Latarjet – 20.7%, Bankart Procedure – 13.7%, Bone-Block Procedure – 3.4% Age 18–25: fracture reposition – 86.2%, Latarjet 24.1%, Bankart procedure – 13.8%, bone-block procedure – 6.9% Age 26–40: fracture reposition – 75.9%, Latarjet – 34.5%, bone-block procedure – 13.8%, bankart procedure – 6.9% Age > 40 years: fracture reposition – 72.4%, Latarjet – 37.9%, bone-block procedure – 10.3%, Bankart procedure – 6.9%
	Question 6: Do you qualify for surgery for non-displaced humeral neck fracture?	No – 93.1%, Yes – 6.9%
	Question 7: Do you qualify for surgery for a displaced fracture of the humeral neck?	Yes – 96.6% No – 3.4%
	Question 8: Do you qualify the patient for surgery in case of the greater tubercle fracture?	2–3mm displacement: No – 75.9%, Yes – 24.1%; 3–5mm displacement: Yes – 68.9%, No – 21.1%; displacement > 5mm: Yes – 100%
	Question 9: What risk factors for shoulder instability do you consider when qualifying a patient for surgery?	Age, sex, accompanying injuries, physical activity, the level of sports practiced, manual work, re-sprain, Hill-Sachs fracture, acetabular defect, acetabular fracture, joint laxity, neurological disorders
Part IV. Follow- up after FTASD	Question 1a: Do you order orthopedic checkup?	Yes – 100%
	Question 1b: When do you order an orthopedic checkup?	Up to 2 weeks after reposition – 44.8%; 2 weeks after reposition – 55.2%
	Question 1c: Do you order orthopedic checkups for persistent pain following a dislocation?	Yes – 96.6%, No – 3.4%
	Question 1d: When do you order an orthopedic check-up for persistent pain after a dislocation?	< Week – 14.8%; 2 weeks – 29.6%; 3–4 weeks- 29.6%; > 4–6 weeks – 18.5%
	Question 1e: If you have persistent apprehension (> 6 weeks) after a dislocation, what is your behavior?	I expand diagnostic imaging – 72.4%; I propose surgery – 65.5%
	Question 1f: How do you check shoulder stability at check-up?	Clinical tests: Yes – 100%; In imaging methods: Yes – 37.9%, No – 62.1%
	Question 2a: What diagnostic tests do you order to diagnose rotator cuff tear?	MRI – 85.7%; USG – 64.3%; artroMRI – 7.1%
	Question 2b: What is your management of a shoulder joint dislocation with a rotator cuff tear?	Surgical treatment of instability and repair of the rotator cuff – 79.3%; Surgical treatment of the rotator cuff – 55.2%; Rehabilitation treatment – 10.3%; Surgical treatment of instability – 3.4%
	Question 3a: Are you conducting a clinical examination of the brachial plexus function?	Yes – 96.6%; No – 3.4%
	Question 3b: When / after how many weeks after dislocation do you test the brachial plexus function?	Always – 24.2%, Before and after the setup – 55.7% After the setup and on the first visit – 20.1%
	Question 3c: Do you have an inspection if you suspect damage to the brachial plexus during dislocation?	Yes – 100%
	Question 3d: When do you have an inspection for suspected brachial plexus injury during dislocation?	Up to 3 weeks – 27.6%; 3–6 weeks – 53.8%; Over 6 weeks – 18.6%
	Question 3e: What additional tests do you order if you suspect a brachial plexus injury during dislocation?	EMG – 93.1%, MRI – 31%, MRI of the brachial plexus – 37.9%, MRI of the cervical spine – 3.4%, USG – 27.6%, TK – 0%
	Question 3f: When do you order another inspection if you suspect damage to the brachial plexus during dislocation?	After 3 weeks – 33.3%, after 6 weeks – 33.3%, After 4 weeks – 16.7%, after a week – 4.2%, After 12 weeks – 4.2%

examination to assess the extent of the suffered injuries.

Radiological evaluation is a key element in the diagnosis of shoulder dislocation. In order to correctly visualize the dislocation of the shoulder joint, almost 100% of respondents recommended taking two X-rays: in the antero-posterior projection and one of the additional projections (lateral "Y" or axillary). They allow to assess the relationship of the humeral head to the acetabulum and to diagnose the presence of potential fractures. The agreement of participants is consistent with the data available in the literature (Hovellius *et al.* 1982; Slaa *et al.* 2005). The main risk of failure to perform an x-ray is overlooking a dislocation or fracture and possible legal consequences resulting from the possibility of alleging a lack of due diligence in the diagnostic process. On the other hand, it has been found that experienced trauma surgeons are able to recognize a dislocation with a high degree of certainty and efficiency, up to 100%, on the basis of clinical evaluation (history and tests) (Hendey *et al.* 2000; Shuster *et al.* 1999; Shuster *et al.* 2002; Reid *et al.* 2013). There was agreement on the necessity of anesthesia, however, what is interesting, as many as 51.7% of respondents allow reposition without anesthesia in emergency cases. Scientific evidence clearly shows that pain leads to involuntary and voluntary muscle contraction, which makes adjustment difficult and increases the risk of iatrogenic damage (Yiannakopoulos *et al.* 2007; Taylor *et al.* 1997; Calandra *et al.* 1989; Beattie *et al.* 1986; Chitgopkar *et al.* 2005; Ahmad *et al.* 2007), so general anesthesia or sedation with additional local anesthesia seems to be the optimal management at present.

To confirm the correct setting, 96.6% of respondents recommend an X-ray in the AP projection, and 89.6% additionally an X-ray in the Y or axial projection. However, experienced surgeons, as shown by studies, are rather confident (93%) and effective in the clinical diagnosis of correct reduction without fracture (100%) and with fracture (86–100%) (Hendey *et al.* 2000) therefore the necessity to perform

a control X-ray is questioned and should be an individual decision based on a patient's own experience and clinical examination. The lack of full compliance in our survey regarding the necessity to take one or more X-rays corresponds to the current studies results. If concomitant pathology caused by dislocation is suspected, it is recommended to extend the diagnostic imaging. A meta-analysis conducted by (Longo *et al.* 2004) showed that among 2.813 patients after FTASD, aged 28 years on average, 39.6% had labrum damage (bankart type or ALPSA type), 33.5% had bone damage (Hill-Sachs fracture, glenoid rim fracture or fracture of the greater tubercle of the humerus) and 6.5% had rotator cuff tear. Among the members of PSES, there was no consensus on the best imaging method. The most frequently mentioned methods of imaging were computed tomography, ultrasound and magnetic resonance imaging (Figure 1). The gold standard in the assessment of bone structure defects in the shoulder joint is computed tomography (CT) with 3D reconstruction. Recently, there are more and more reports favoring magnetic resonance imaging (MRI), because of the similar sensitivity in detecting bone defects in the absence of patient exposure to ionizing radiation, as well as the possibility of visualizing any soft tissue damage, especially the labrum and rotator cuff (Owens *et al.* 2013; Brzóska *et al.* 2019). Prolonged pain in patients over 40 years of age may indicate damage to the tendons of the rotator cuff, which is also an indication for MRI. (Figure 1).

Due to the risk of damage to the brachial plexus, and most of all to the axillary nerve, the neurological examination of the limb is an integral part of the diagnosis of dislocation of the shoulder joint. Most of the surveyed members of the PSES perform electromyography (EMG) examinations in the event of suspected plexus damage, however, there was no full consensus for this (Figure 2). It is a helpful tool in assessing peripheral nerve function, but its result, especially in the acute post-traumatic period, may be false, and any

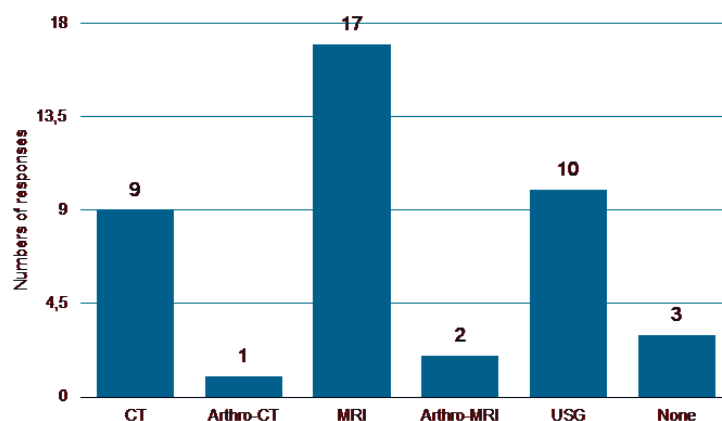


Figure 1. Types of imaging diagnostics used to extend the diagnosis of shoulder dislocation. CT – Computed tomography; Arthro-CT – Computed tomography arthrogram; MRI – Magnetic resonance imaging; Arthro-MRI – Magnetic resonance arthrography; USG-ultrasound

discrepancy between physical examination and EMG results should be handled with caution. EMG testing is valuable in monitoring the recovery of plexus function. However, the main goal of diagnostics in the case of brachial plexus damage should be the prognosis of the possibility of spontaneous nerve regeneration. For this, additional specialized imaging may be necessary to determine the morphology, location and extent of possible damage (MRI, USG). This is a precondition for possible early reconstructive treatment. Such diagnostics and treatment are usually possible in centers specializing in peripheral nerve injuries (Figure 2).

Post-reposition procedure

The treatment procedure after the first dislocation of the shoulder joint remains the subject

of controversy and no clear guidelines or an algorithm have been developed so far. The duration and position of limb immobilization are not clearly defined, and the scientific data show a large discrepancy in this respect. There was also a wide discrepancy in the results of our survey regarding the necessity and length of the used immobilization. In the results, for adolescents after dislocation, 41.4% of surgeons suggested immobilization for 3–4 weeks, 27.6% for 2–3 weeks, 20.1% for less than 2 weeks, and 6.9% for more than 4 weeks. In patients aged 18–39 years, 51.7% of surgeons were in favor of immobilization for 3–4 weeks, 27.6% for immobilization for 2–3 weeks, and 17.2% for less than 2 weeks. For patients aged 40–60 years, 41.4% of surgeons suggested immobilization for 2–3 weeks, 24.1% for less than 2 weeks, 17.2%

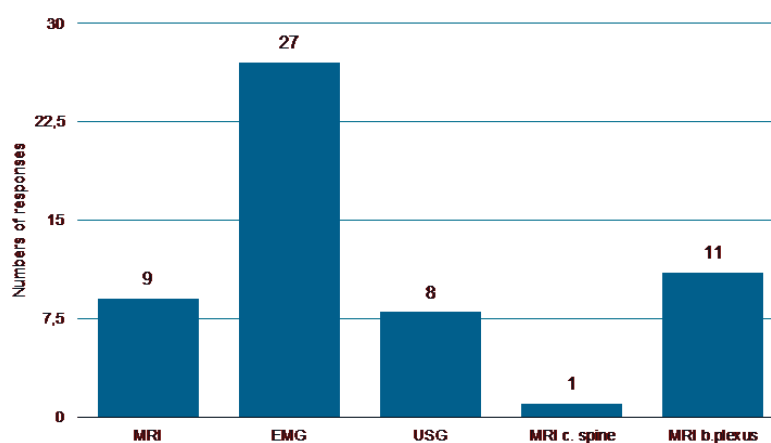


Figure 2. Diagnostic methods used to assess the damage of nerve structures.

recommended immobilization for 3–4 weeks, and 17.2% no immobilization. For patients > 60 years of age, immobilization of less than 2 weeks (37.9%) or no immobilization (31%) was suggested most often (Figure 3).

rotation immobilization as providing more optimal conditions for the healing of damaged tissues. The authors suggested a significantly reduced risk of re-dislocation, especially in younger patients (Itoi *et al.* 2001), however,

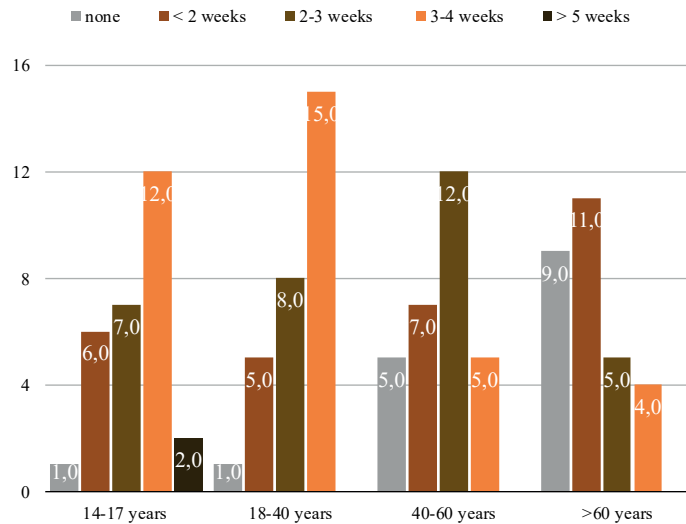


Figure 3. Length of the immobilization period depending on the patient's age.

The results of the current studies also do not give a clear answer regarding the length of the immobilization used after the FTASD. The meta-analysis conducted by (Paterson *et al.* 2010) did not prove the advantage of a specific period of immobilization over others, despite the popular theory of the need for longer immobilization in young people to prevent recurrent instability. The conclusions from the available scientific studies emphasize that the key parameter for the period of immobilization, both in the group of younger and older patients, is pain relief. In young patients, it is usually 1–4 weeks and in older patients 1–2 weeks (Paterson *et al.* 2010).

Non-compliance was also observed in response to a question about the immobilization position. 48.3% of our surgeons preferred the abdominal position, 41.4% neutral and 10.3% external rotation. Data from research studies are also inconclusive on this point. The work published by (Itoi *et al.* 2001) pointed to the advantages of external

studies by other authors did not confirm these conclusions (Whelan *et al.* 2014; Liavaag *et al.* 2011). In addition, external rotation can be difficult to maintain over a long period of time for some patients. However, work is still underway on the improvement of orthoses that keep the shoulder in a neutral position, and studies comparing the effectiveness of such immobilization.

Rehabilitation

86.2% of the respondents were in favor of implementing rehabilitation treatment after the FTASD. There was no agreement among the respondents as to the best method of rehabilitation. Among the listed answers kinesiotherapy was 82.8% and dominated, manual therapy was 27.6% and physical therapy was 10.3% (Figure 4). Conclusions from the studies published so far do not allow for the issuing of clear recommendations regarding the rehabilitation protocol. Typically, in the published recommendations, the standard rehabilitation protocol began

with the immobilization of the limb in the brace in the neutral or adduction position for a period of 3–4 weeks. From the second week, exercises for gradual extension of the range of external rotation, abduction and flexion were started, and isometric and isotonic muscle strength exercises were included. Typically, from the 7th week after dislocation, patients achieved full range of motion in the joint and advanced stabilization and resistance exercises were introduced (Longo *et al.* 2014; Braun *et al.* 2019). This is in line with the survey results, according to which the respondents indicated kinesiotherapy as the main rehabilitation measure (Figure 4).

with an average age of 20.8 years who had rehabilitation treatment with chronic joint instability (De Carli *et al.* 2019). In the latest Cochrane Library analysis from 2019 assessing the results of conservative treatment after setting an anterior shoulder dislocation, the percentage of recurrent dislocations in the first year after reposition was 22–30% in the group of patients with an average age of 29.1 years (Braun *et al.* 2019). In a comprehensive analysis of the management of the first-time shoulder dislocation (Longo *et al.* 2014), the recurrence rate after rehabilitation treatment was 37.5%. Therefore, it seems that the goal of the modern approach in the

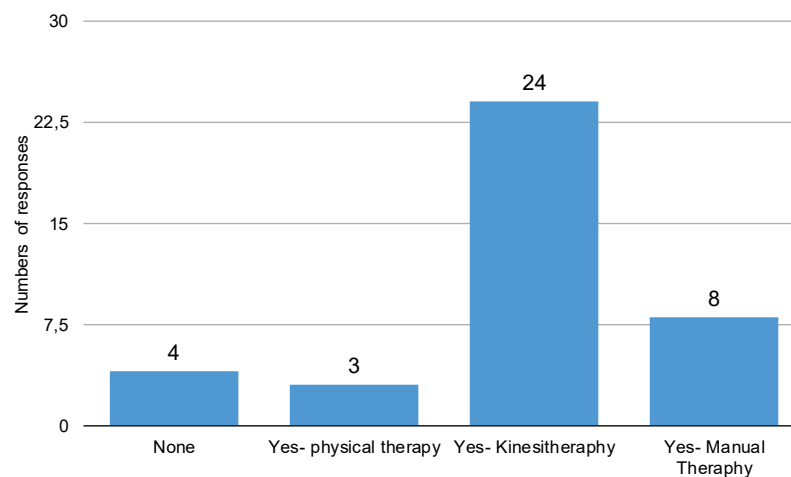


Figure 4. Recommendations for rehabilitation.

The aim of rehabilitation treatment after the episode of first-time dislocation of the shoulder joint is a quick recovery of function and an attempt to prevent the development of recurrent instability of this joint (Robinson *et al.* 2004; Khiami *et al.* 2015). As a result of limb immobilization, we are also usually concerned with contracture of the elbow joint and traumatic stiffness of the shoulder joint, therefore the optimal rehabilitation regimen should also focus on reducing the risk of these complications.

When estimating the effectiveness of rehabilitation treatment after the FTASD, De Carli *et al.* in 2019, with an average follow-up of 6.5 years, found 71.4% of patients

rehabilitation of a patient after the FTASD is the rapid return of the limb to function and patient education. Determining a safe range of motion and elimination of dangerous positions of the limb, especially in the abduction and external rotation, may be an alternative for patients who are not surgically treated (Plath *et al.* 2018).

Return to sport

There was no agreement among the respondents as to the proper time of return to sport. 69% of surgeons recommend returning to sport after 3 months, 10.3% after 2 months and 10.4% after 4 months. When it comes to returning to professional sports, 62.1% were

in favor of returning after 3 months, 13.8% chose to return after 2 or 4 months, 6.9% after 6 months (Figure 5).

motion adequate to the performance of a given sport is painless and the strength is comparable to the other side (Watson et al. 2016).

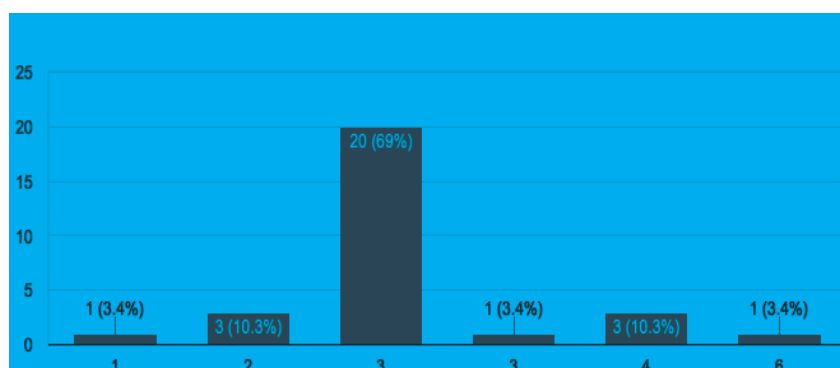


Figure 5. Time (in months) to return to sport.

Among the criteria that were taken into account when deciding to return to sport, the most frequently mentioned were: pain – 79.3%, the result of an orthopedic test 75.9%, fear 72.4%, strength 37.9%, biomechanical tests 20.7% and questionnaires self-esteem 17.2% (Figure 6).

Interestingly, in our survey, respondents placed more emphasis on no pain, no fear, and no clinical testing than strength (Figure 6). In a study performed by Dickens, the effects of a player's very quick return to sport in the middle of the season were assessed (Dickens et al. 2014; Dickens et al. 2017). Conservative

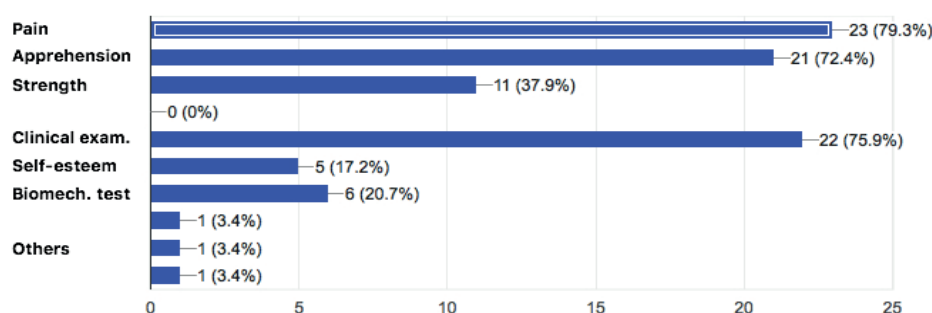


Figure 6. Factors taken into account when deciding whether to return to sport.

Return to sport is one of the most important criteria for patients who decide to undergo treatment after shoulder dislocation, and the vast majority of patients expect that it will be a return to the pre-injury level (Plath et al. 2018; Trojan et al. 2019). Unfortunately, there are no golden criteria for the timing and symptoms (lack of them) that will allow athletes to return to pre-injury activity and research does not give a clear answer. It is widely recognized that an athlete is ready to return to training at the maximum level and competition when the obtained range of

treatment was implemented, consisting in undergoing an accelerated rehabilitation program, without immobilizing the limb. 73% of competitors managed to return to the competition after an average period of 5 days, unfortunately as many as 64% of them experienced subluxations or sprains during the rest of the season. Despite this, 67% of the players who made it back to the game finished the season.

In the case of professional athletes, no relationship has been demonstrated between the use of a brace and the frequency of

re-dislocations (Dickens *et al.* 2014). Another study conducted on professional athletes showed that players treated surgically after the first dislocation had a 5.8 times greater chance of completing the next season of games without dislocation of the joint than players treated conservatively (Dickens *et al.* 2017).

Return to physical work

There was no agreement among the respondents as to the proper time of return to physical work. 62.1% of the respondents were in favor of returning to work after 3 months, 13.8% in favor of returning to work after 2 or 4 months, and 6.9% indicated that they would return to work after six months. (Figure 7). As indicated by the study by Plath *et al.* as many as 99% of patients after the first dislocation of the shoulder joint expect the restoration of normal limb functionality in everyday activities (Plath *et al.* 2018). The time recommended in the literature for returning to physical work is very similar to that for returning to recreational sport and is approximately 3 months. It requires painless execution of job-specific movements and a negative worry test. The recommendations also emphasize the role of surgical treatment in the case of physical work that poses a greater risk of recurrent dislocation of the joint (Longo *et al.* 2014; Braun *et al.* 2019).

pathologies are present, but also in this case full agreement was not observed. 79.3% of respondents were in favor of surgical treatment with problems with repositioning, 89.7% with relapse of dislocation after setting, 72.4% with accompanying acetabular fracture (Figure 8). For problems with reposition after dislocation, the possibility of soft tissue interposition such as the subscapularis muscle tendon, the tendon of the long head of the biceps brachii, displaced labrum, and even a locked musculocutaneous nerve should be taken into account. The interposition may also be of bone origin in the case of a humeral fracture with displacement of a greater tubercle or a large Hill-Sachs fracture. In such a case, it may be advisable to set up a simultaneous treatment of accompanying lesions. Taking into account acetabular fractures, the classic criteria for surgical treatment published by Cole refer to fractures involving over 25% of the glenoid, displaced > 20mm and angular displacement (Cole *et al.* 2012). However, more recent studies show that excellent results are achieved in the case of surgical treatment of less extensive glenoid fractures after FTASD (Porcellini *et al.* 2002). Therefore, the decision should be made on the basis of an individual approach to a patient.

In the questions concerning the complications of dislocation, 6.9% of the respondents would treat a non-displaced fracture of the

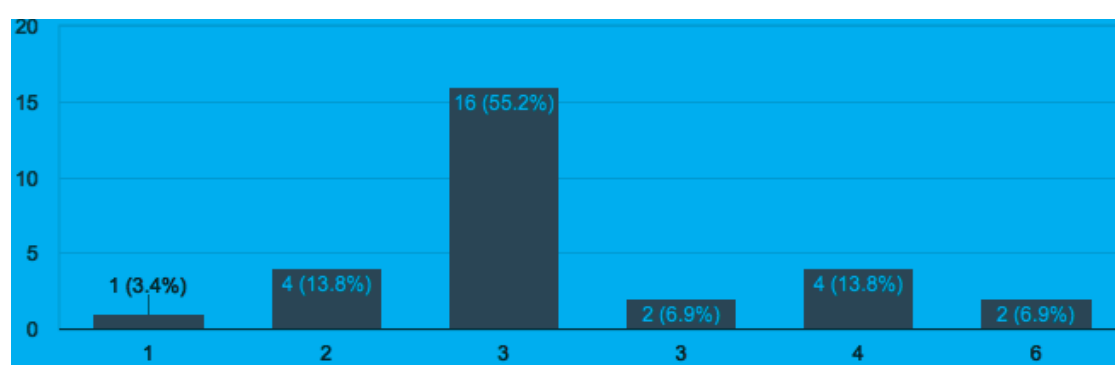


Figure 7. Time (in months) to return to physical work.

Surgery

The respondents, members of PSES emphasized in their responses the importance of acute surgical treatment in FTASD if some

humeral neck, but 96.6% of the respondents would treat a displaced fracture. As for the fracture of the greater tubercle of the humerus, 0% would choose surgery with a displacement

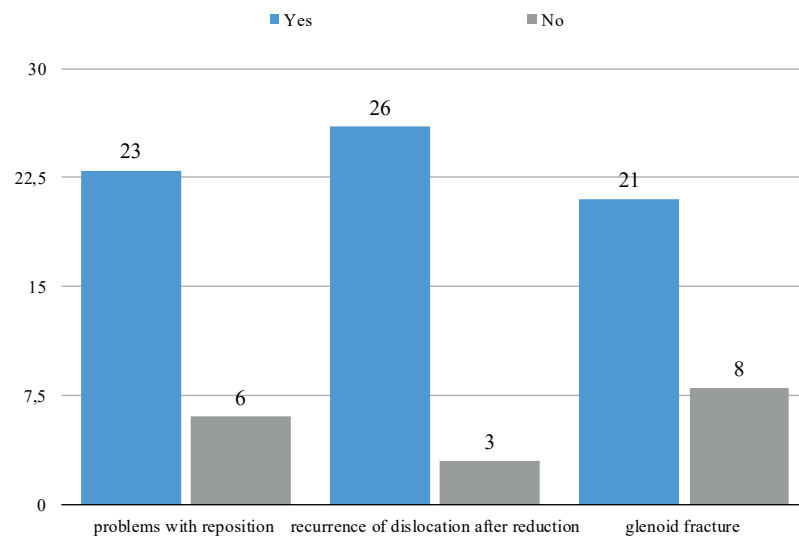


Figure 8. Factors requiring emergency surgery.

less than 2mm; 24.1% for 2–3mm displacement, 68.9% for 3–5mm displacement, and 100% for more than 5mm displacement. There are few reports in the literature dealing strictly with the surgical treatment of a fracture of the humeral neck after dislocation, and the indications include mainly dislocated fractures. As for the fractures of the greater tubercle, there is an agreement as to the need to treat fractures with displacement above 5mm, while as in the results of the survey, displacements 3–5mm are a matter of dispute.

The survey devoted also a space to questions about the necessity and methods of stabilization of the joint after FTASD based on various factors such as age and acetabular loss. This topic has been a subject of controversy for many years, therefore, both in our survey and in the available studies, there is no agreement as to the best method of joint stabilization, as well as the need to perform it after the FTASD. In our survey, the greatest discrepancy concerned the choice of surgical treatment after a dislocation. For patients with acetabular defect < 20%, 14–17 years of age, 72.4% supported fracture reposition, 34.3% for the Bankart procedure, and 20.1% for the Latarjet method. In the 18–25 and 26–40 age group, fractures were less likely to be repositioned – 55.2% and 41.4%, respectively, and more often to Bankart treatment,

44.8% and 58.6%, or a lantern – 24.1% and 27.6%, respectively. In older patients, over 40 years of age, the most frequently chosen treatment method was Bankart's method 65.5% or fracture reposition 34.5% (Figure 9).

In the case of acetabular fracture > 20%, regardless of the age group, the most frequently chosen response was fracture reposition – 89.7% for 14–17 years, 86.2% for 18–25 years, 75.9% for 26–40 years and 72 years, respectively, 4% for > 40 years. The second most frequently chosen answer was the Latarjet procedure – 20.7% for 14–17 years, 24.1% for 18–25 years, 34.5% for 26–40 years and 37.9% for > 40 years, respectively (Figure 10).

Numerous methods of surgical treatment indicated by the respondents gain support in the currently presented research, which emphasizes how controversial this topic is. A meta-analysis by Lungo *et al.* showed that the rate of consecutive dislocation for patients with arthroscopy was 9.6% (Longo *et al.* 2014) compared with 37.5% for relapse for patients treated conservatively (Chitgopkar *et al.* 2005). The method of arthroscopic treatment of the glenoid fracture developed in 2005 (Sugaya *et al.* 2005) with subsequent modifications introduced by other authors (Scheibel *et al.* 2016). It is a relatively new method and has gained a large group of supporters due to the fact that it is the only

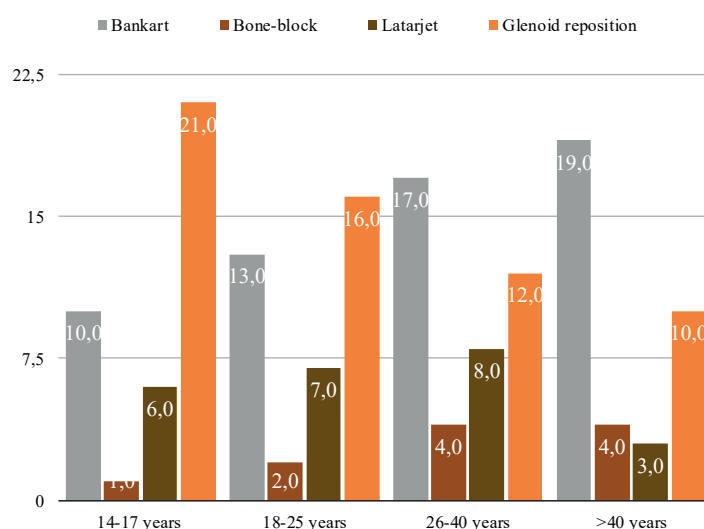


Figure 9. Surgical techniques for a defect < 20% of the glenoid.

one that provides the possibility of anatomical reconstruction of anatomical relations in the shoulder joint. The respondents also indicated relatively frequent qualifications for surgical treatment in young people. Meta-analysis of underage patients (Olds *et al.* 2015) showed that adolescents aged 14–18 years are 24 times more likely to experience chronic instability after first-time dislocation than other age groups, so they should be treated with special attention. It should always be borne in mind that any surgical treatment is associated with a higher cost of treatment, more complications and treatment failure. Moreover, many surgically treated patients might never develop chronic instability after the first dislocation, hence the qualification for treatment should always take into account the degree of damage, individual parameters and patient expectations. Certification of ISIS (Balg et Boileau 2007) may be a useful tool.

Outpatient control and treatment of complications

There was full agreement as to the necessity of the inspection with no agreement as to its timing and the diagnostic procedures used in the event of suspected additional damage. 100% of respondents were in favor of ordering an outpatient control after being supplied to the emergency department. 44.8% order

a check-up 2 weeks after supply, and 55.2% after 2 weeks. 96.6% of the respondents perform a brachial plexus function test, of which 24.2% perform it always (at the time of supply and at each control visit), 55.7% before and after setting, and 20.1% after setting, and only on the first control visit. 100% of the respondents order an inspection in the event of suspected plexus damage, of which 27.6% up to 3 weeks, 53.8% 3–6 weeks, and 18.6% after 6 weeks. Of the additional tests ordered when a plexus injury was suspected, 93.1% chose EMG, 31% MR of the shoulder, 37.9% MR of the brachial plexus, 3.4% of the MR of the cervical spine, and 27.6% of USG. If plexus damage is suspected, 33.3% order a second orthopedic check-up 3 weeks after the first, 33.3% 6 weeks after the first, 16.7% after 4 weeks, 4.2% after a week or after 12 weeks.

In the case of pain that persists after dislocation, 96.6% of respondents order orthopedic control, of which 14.8% up to one week after treatment, 29.6% after 2 or 4 weeks, and 18.5% after 4–6 weeks. In order to diagnose rotator cuff damage, 85.7% order MRI, 64.3% USG, and 7.1% ArthroMR. In the case of shoulder joint dislocation complicated by damage to the rotator cuff, 79.3% of respondents chose surgery for instability as a form of treatment, along with repair of the rotator cuff. 55.2% surgical treatment of the rotator cuff, 10.3% rehabilitation treatment, and 3.4%

only instability treatment. In the case of a persistent feeling of instability, 72.4% extend the imaging diagnostics with additional tests, and 65.5% of the respondents propose surgery. During the outpatient follow-up examination, 100% of respondents check the stability of the shoulder joint in clinical tests, and 37.9% additionally in imaging methods (Figure 10).

The development of materials supporting decision-making, and perhaps even recommendations, can significantly help in ordering and improving not only the knowledge of doctors but also the final results of treatment.

Different proceedings at each stage of the diagnosis and treatment of FTASD may result from both customary differences, passed

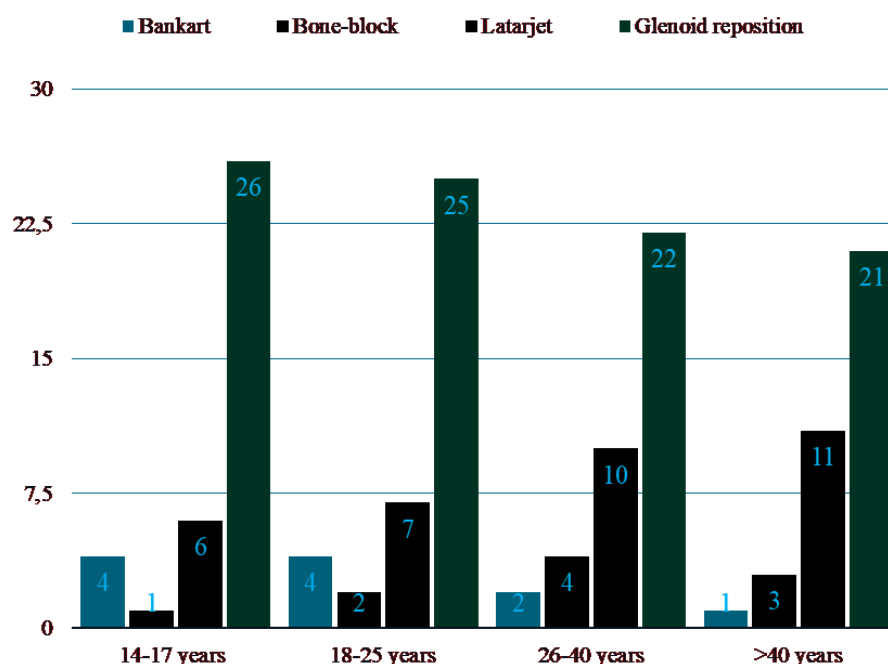


Figure 10. Surgical techniques for a defect > 20% of the glenoid.

Conclusions

The management of a patient with a first-time dislocation is a complex diagnostic and therapeutic process that involves many decisions of a therapeutic team and a patient from the moment of the injury until the return to everyday life.

The survey assessment showed that doctors agree in some decisions, but in most cases, opinions about the procedure are very different.

The available evidence is in many cases inconclusive, which makes it impossible to develop the best standard at each stage of the procedure. However, in individual elements, it should be possible to develop recommendations based on scientific evidence, as demonstrated by the guidelines introduced in the Netherlands.

down through the generations, and deeply rooted in local traditions, as well as technical possibilities. It should be emphasized that, especially at the diagnostic stage, the availability of individual imaging methods influences the decisions of the treating team. In some regions from which the surveyed doctors come, the possibilities of supplying FTASD are determined by the lack of availability of individual diagnostic and treatment methods.

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