Arthroscopic Management of Shoulder Periarticular Cysts

39

Anestis Iossifidis and Georgios Togias

Abstract

Paralabral ganglion cysts are uncommon with a prevalence of 2.3%. Magnetic resonance imaging studies have shown that the most common location of the cysts is posterosuperior in 71–90% of cases mainly at the spinoglenoid notch, and may extend superiorly or inferiorly, resulting in suprascapular nerve compression in 13–62% of cases. Paralabral cysts may be associated with labral tears in 43–59% of cases. Nerve compression by a ganglion cyst requires early diagnosis and surgical decompression to avoid irreversible muscle atrophy and long-term disability. Recent studies have confirmed that combined treatment of cyst and labrum lesions achieves excellent functional outcome scores. External rotation strength recovery has been reported in 85–100% of cases. Overall, 95.2% of athletes were able to return to sport, and 88% were at the preinjury level. The authors' preferred technique is a decompression of the cyst in the subacromial space under direct vision with careful dissection and suprascapular nerve protection, associated with an intraarticular repair of any labral lesions if present.

Keywords

Shoulder periarticular cysts · Paralabral cyst
Spinoglenoid cyst · Arthroscopic cyst decompression
Supraclavicular nerve decompression · Infraspinatus atrophy

39.1 Introduction

Paralabral ganglion cysts (GC) are uncommon with a prevalence of 2.3% [1]. The cyst's wall is formed by dense fibrous connective tissue, and its content is a very viscous fluid rich in hyaluronic acid and mucopolysaccharides [2]. It is formed either by myxoid degeneration of periarticular connective tissues or by a synovial fluid leak in the periarticular tissues through capsular tears at the labral-glenoid junction via a one-way valve mechanism [3, 4].

Magnetic resonance imaging (MRI) studies have shown that the most common location of the cysts is posterosuperior in 71–90% of cases, mainly at the spinoglenoid notch, and may extend anterosuperiorly or posteroinferiorly [1, 3]. The GC size may vary from 0.5 to 6 cm and 59% are large and multilocular [1].

GC expansion may compress the suprascapular nerve above the spinoglenoid notch resulting in supra and infraspinatus muscle denervation, or more often at the spinoglenoid notch leading to isolated infraspinatus atrophy. Not all ganglion cysts, however, result in nerve compression, which occurs in 13–62% of cases particularly when the GC's average size is 3 cm [1, 3, 5, 6]. GC are associated with posterior labral tears in 48–59% of cases [3, 4, 7], or superior labral anterior-posterior (SLAP) tears in 43–50% of cases [5, 6, 8]. More importantly, 93% of cysts are located in the same quadrant as the labral tear [4].

Symptomatic cysts present with deep and diffuse posterior shoulder pain and weakness of external rotation. The reported average time from onset of symptoms to surgery is 8 months [5, 9]. Nerve compression by a ganglion cyst, however, requires early diagnosis and surgical decompression to avoid irreversible muscle atrophy and long-term disability [10].

Arthroscopic techniques have evolved over the last decade, and can now address both the GC and any associated labral lesion with successful outcomes and low morbidity. There are two techniques of cyst decompression, either intraarticular or subacromial. In the intraarticular procedure,

A. Iossifidis (✉)
Shoulder and Upper Limb Unit, Department of Trauma and Orthopaedic Surgery, Croydon University Hospital, London, UK

G. Togias
Croydon University Hospital, London, UK

T. H. Lui (ed.), *Arthroscopy and Endoscopy of the Shoulder*, https://doi.org/10.1007/978-981-19-7884-5_39

the GC is decompressed from within the joint without direct visualisation of the cyst, either through a posterosuperior capsulotomy just above the labrum [8, 11–14] or through a labrum tear [5, 15–18].

Disadvantages of the intraarticular approach include the risk of suprascapular nerve injury, as the nerve lies within 1.8 cm from the posterior glenoid rim [19, 20], incomplete decompression due to a restricted field, and the presence of large and multilocular cysts. In order to mitigate these risks several authors prefer decompression of the cyst in the subacromial space under direct vision with careful dissection and nerve protection [6, 21–25].

39.2 Indications

Symptomatic ganglion cyst in the spinoglenoid area with MRI evidence of muscle denervation or atrophy and diagnosis of suprascapular neuropathy with electromyography and nerve conduction studies.

39.3 Contraindications

- Asymptomatic cysts
- Other causes of denervation

39.4 Author Preferred Technique

Arthroscopic spinoglenoid cyst decompression through the subacromial space.

39.4.1 Pre-operative Planning

Prior to anaesthesia clinical notes and imaging studies are reviewed and the correct side is marked. It is important to ensure that all instruments required for the procedure are available and in working order. These may include the water management inflow/outflow pump, camera and light source, radiofrequency system, joint shaver system, suture anchors, surgical set of arthroscopic instruments (suture manipulators, cutters, graspers, and bird-beak tissue penetrators), and twist-in 6 and 8.25 mm cannulas.

39.4.2 Patient Positioning

The procedure is performed under interscalene cervical plexus block and balanced general anaesthesia in the beach chair position. A limb positioner or traction system is used. Preventative measures mitigating the risk of skin and neurovascular compression are taken, using heel pads, a cushion beneath the knees and protection of the ulnar nerve of the contralateral elbow. The head and neck should remain in neutral alignment.

39.4.3 Portal Design

The shoulder is marked to allow for percutaneous localisation of the appropriate portal position. A two-portal surgical technique is used for the intraarticular stage: standard posterior for visualisation (P) and anterosuperior (AS) through the rotator cuff interval used as a working portal for anchor insertion and suture management if required (Fig. 39.1).

Three portals are required for the subacromial stage of the procedure. A viewing posterior portal (P), a lateral working portal (L) and a posteromedial portal (LP) for infraspinatus retraction (Fig. 39.2).

Twist-in 6 and 8.25 mm anterosuperior cannulas are used to facilitate unimpeded suture and anchor instrumentation. Accurate portal placement is crucial for optimal visualisation and achieving the correct working angle for the arthroscopic instruments. This is assisted with an outside-in technique using an 18-gauge spinal needle.

39.4.4 Step-by-Step Description of the Technique

Arthroscopic spinoglenoid cyst decompression through the subacromial space.

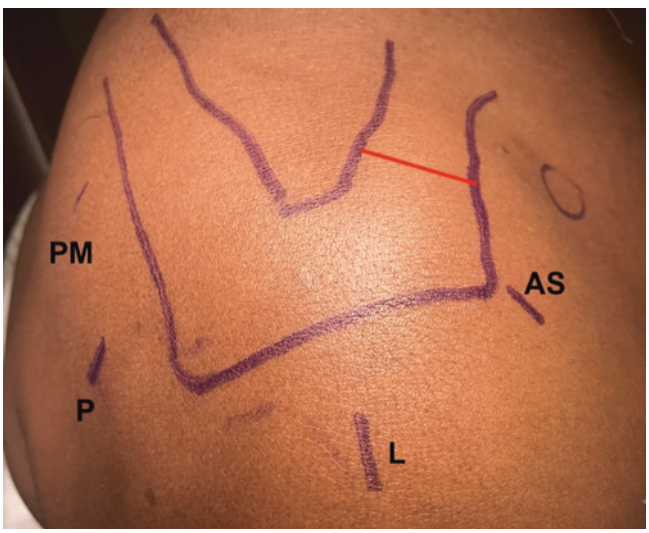

Fig. 39.1 Portal position. *PM* posteromedial, *P* posterior, *L* lateral, *AS* anterosuperior

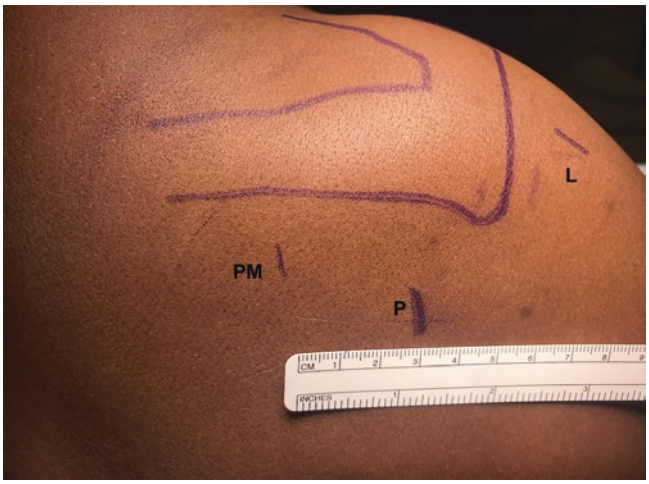

Fig. 39.2 Portal position. *PM* posteromedial, *P* posterior, *L* lateral

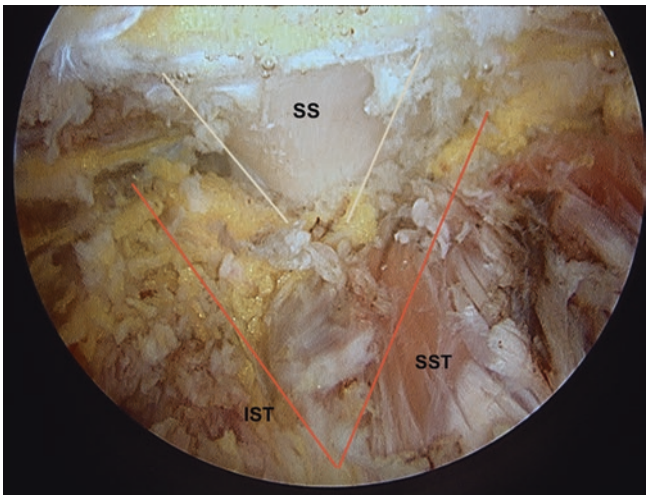

Fig. 39.3 Anatomy landmarks in the subacromial space. *SS* spine of scapula, *IST* infraspinatus muscle, *SST* supraspinatus muscle

39.4.4.1 Intraarticular Stage: Management of Labral Lesions

We establish a standard posterior portal through the soft spot and the scope is inserted in the glenohumeral joint. An anterosuperior portal is created through the rotator interval using an outside-in technique with the help of an 18-gauge spinal needle. Diagnostic arthroscopy identifies any associated intra-articular pathology. Any posterior labral tear or SLAP tear if present is debrided or repaired depending on the lesion type.

39.4.4.2 Subacromial Stage: Spinoglenoid Ganglion Cyst Decompression

1. Subacromial bursectomy: The scope is moved to the subacromial space through a posterior portal and a standard subacromial bursectomy is performed through a lateral working portal.
2. Exposure of the spinoglenoid notch: Gentle dissection advancing from anterior to posterior with a motorised shaver identifies the scapular spine between the supraspinatus anteriorly and the infraspinatus muscles posteriorly (Fig. 39.3). Dissection with a motorised shaver should not extend beyond the safe zone 1 cm medial to the glenoid rim. At this stage the infraspinatus muscle is retracted using a probe inserted through an accessory posteromedial portal, to improve visualisation (Fig. 39.4). The cyst is usually found between the scapular spine and the posterior rim of the glenoid. A probe can be used to palpate the posterior rim of the glenoid and progress medially identifying the cyst (Fig. 39.5), which is then incised and the viscous content can be aspirated with a shaver (Fig. 39.6).

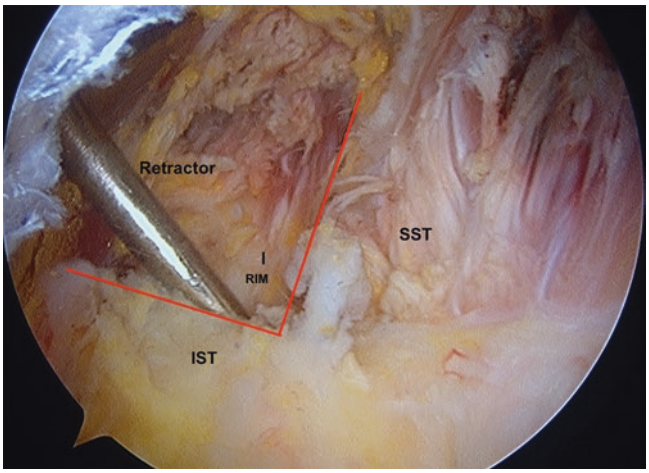

Fig. 39.4 Anatomy landmarks in the subacromial space. *IST* infraspinatus muscle, *SST* supraspinatus muscle, *RIM* glenoid rim

39.4.5 Complications

Momaya et al. (2017) in a systematic review of 269 shoulders reported only 2 (0.74%) complications. A case of superficial soft tissue infection and one case of adhesive capsulitis [10]. Other authors reported no complications or recurrences at 24 [6] and 51 months, of follow-up [5].

39.4.6 Post-operative Care

For isolated cyst decompression, a sling is used for the first week. Passive range of motion exercises is allowed from the

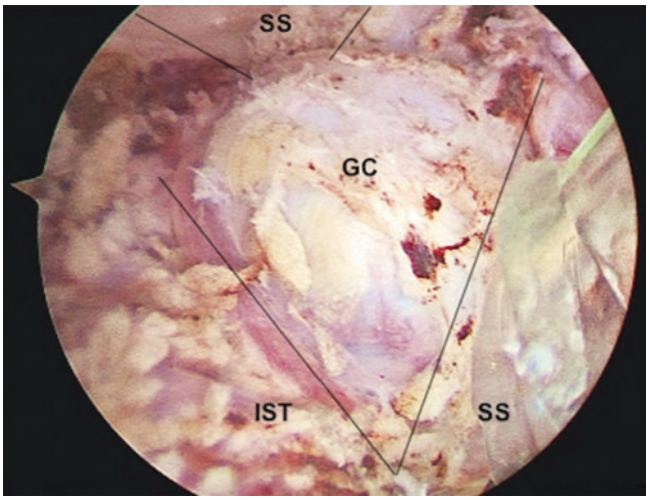

Fig. 39.5 Cyst location in the subacromial space. *GC* ganglion cyst, *SS* spine of scapula, *IST* infraspinatus muscle, *SST* supraspinatus muscle

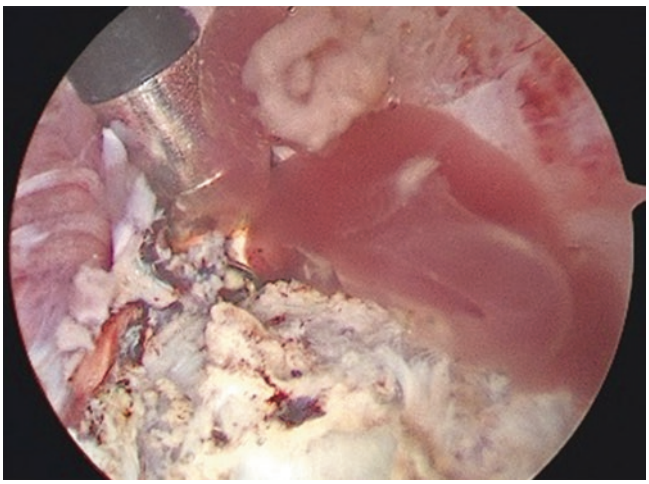

Fig. 39.6 Discharged viscous content of the cyst in the subacromial space

first day. In the second week, active exercises start as tolerated, and in the third week, a strengthening exercises program commences. Full return to activities is expected at 6 weeks.

39.4.7 Outcome

Recent studies have confirmed that combined treatment of cyst and labrum lesions achieves excellent functional outcome scores [6, 8, 10, 18, 21, 23–25].

Following cyst decompression, external rotation strength recovery has been reported in 85–100%, of cases [5–7, 16]. Overall, 95.2% of athletes were able to return to sport, and 88% were at the preinjury level [10].

39.5 Conclusion

Paralabral ganglion cysts are located mainly posterosuperiorly at the spinoglenoid notch and in more than half the cases are associated with labral tears and suprascapular nerve compression. Nerve compression by a ganglion cyst requires early diagnosis and surgical decompression to avoid irreversible muscle atrophy and long-term disability.

The authors' preferred technique is a decompression of the cyst in the subacromial space under direct vision with careful dissection and suprascapular nerve protection, associated with an intraarticular repair of any labral lesions if present. Cyst decompression achieves excellent functional outcome scores and high rates of external rotation strength recovery.

References

1. Tung GA, Entzian D, Stern JB, Green A. MR imaging and MR arthrography of paraglenoid labral cysts. Am J Roentgenol. 2000;174(6):1707–15.
2. O'Valle F, Hernández-Cortés P, Aneiros-Fernández J, Caba-Molina M, Gómez-Morales M, Cámara M, Payá JA, Aguilar D, Del Moral RG, Aneiros J. Morphological and Immunohistochemical evaluation of ganglion cysts. Cross-sectional study of 354 cases. Histol Histopathol. 2014;29(5):601–7.
3. Tirman PF, Feller JF, Janzen DL, Peterfy CG, Bergman AG. Association of glenoid labral cysts with labral tears and glenohumeral instability: radiologic findings and clinical significance. Radiology. 1994;190(3):653–8.
4. Meraj S, Bencardino JT, Steinbach L. Imaging of cysts and bursae about the shoulder. Semin Musculoskelet Radiol. 2014;18(4):436–47.
5. Westerheide KJ, Dopirak RM, Karzel RP, Snyder SJ. Suprascapular nerve palsy secondary to spinoglenoid cysts: results of arthroscopic treatment. Arthroscopy. 2006;22:721–7.
6. Kim SJ, Choi YR, Jung M, Park JY, Chun YM. Outcomes of arthroscopic decompression of spinoglenoid cysts through a subacromial approach. J Arthrosc Relat Surg. 2017;33(1):62–7.
7. Mall NA, Hammond JE, Lenart BA, et al. Suprascapular nerve entrapment isolated to the spinoglenoid notch: surgical technique and results of open decompression. J Shoulder Elb Surg. 2013;22(11):e1–8.
8. Abboud JA, Silverberg D, Glaser DL, Ramsey ML, Williams GR. Arthroscopy effectively treats ganglion cysts of the shoulder. Clin Orthop Relat Res. 2006;444:129–33.
9. Zehetgruber H, Noske H, Lang T, Wurnig C. Suprascapular nerve entrapment. A meta-analysis. Int Orthop. 2002;26:339–43.
10. Momaya A, Kapisz A, Choate S, Kissenberth M, Tolan S, Lonergan K, Hawkins R, Tokish J. Clinical outcomes of suprascapular nerve decompression: a systematic review. J Shoulder Elb Surg. 2018;27:172–80.
11. Hashiguchi H, Iwashita S, Ohkubo A, Takai S. SLAP repair with arthroscopic decompression of spinoglenoid cyst. SICOT J. 2016;22:1.
12. Piatt BE, Hawkins RJ, Fritz RC, Ho CP, Wolf E, Schickendantz M. Clinical evaluation and treatment of spinoglenoid notch ganglion cysts. J Shoulder Elb Surg. 2002;11:600–4.
13. Millett P, Barton R, Pacheco I, Gobezie R. Suprascapular nerve entrapment. Tech Shoulder Elb Surg. 2006;7(2):89–94.

14. Sreehari CK, Varshney A, Yon-Sik Yoo YS, Lee SJ. Arthroscopic intra-articular spinoglenoid cyst resection following SLAP repair. Arthrosc Tech. 2017;6(5):e1795–9.
15. Chen AL, Ong BC, Rose DJ. Arthroscopic management of spinoglenoid cysts associated with slap lesions and suprascapular neuropathy. Arthroscopy. 2003;19:E15–21.
16. Pillai G, Baynes JR, Gladstone J, Flatow EL. Greater strength increase with cyst decompression and SLAP repair than SLAP repair alone. Clin Orthop Relat Res. 2011;469:1056–60.
17. Lichtenberg S, Magosch P, Habermeyer P. Compression of the suprascapular nerve by a ganglion cyst of the spinoglenoid notch: the arthroscopic solution. Knee Surg Sports Traumatol Arthrosc. 2004;12:72–9.
18. Shon MS, Jung SW, Kim JW, Yoo JC. Arthroscopic all intra-articular decompression and labral repair of paralabral cyst in the shoulder. J Shoulder Elb Surg. 2015;24:e7–14.
19. Bigliani LU, Dalsey RM, McCann PD, April EW. An anatomical study of the suprascapular nerve. Arthroscopy. 1990;6(4):301–5.
20. Gumina S, Albino P, Giaracuni M, Vestri A, Ripani M, Postacchini F. The safe zone for avoiding suprascapular nerve injury during shoulder arthroscopy: an anatomical study on 500 dry scapulae. J Shoulder Elb Surg. 2011;20(8):1317–22.
21. Ghodadra N, Nho SJ, Verma NN, Reiff S, Piasecki DP, Provencher MT, et al. Arthroscopic decompression of the suprascapular nerve at the spinoglenoid notch and suprascapular notch through the subacromial space. Arthroscopy. 2009;25:439–45.
22. Werner CM, Nagy L, Gerber C. Combined intra- and extra-articular arthroscopic treatment of entrapment neuropathy of the infraspinatus branches of the suprascapular nerve caused by a periglenoidal ganglion cyst. Arthroscopy. 2007;23(328):e1–3.
23. Bhatia S, Chalmers PN, Yanke AB, Romeo AA, Verma NN. Arthroscopic suprascapular nerve decompression: transarticular and subacromial approach. Arthrosc Tech. 2012;1:e187–92.
24. Park JH, Lee YS, Park JW, Yoo JC, Kang JW, Park JS. Effective arthroscopic treatment of large, anteriorly extended spinoglenoid cysts. Arch Orthop Trauma Surg. 2010;130:423–6.
25. Plancher KD, Peterson SC. Posterior shoulder pain and arthroscopic decompression of the suprascapular nerve at the spinoglenoid notch. In: Sports injuries. Berlin: Springer-Verlag; 2014. p. 1–40.