

## **On Bankart to Remplissage – A Conversation**

*An AANA Editorial by Jonathan Ticker, M.D. and Michael Pollack, M.D.*

The following includes excerpts from a conversation with Eugene Wolf, M.D. and Jon Ticker, M.D. on June 20, 2019. It included Dr. Wolf's perspective of the evolution of arthroscopic treatment of instability from Bankart repair to remplissage, highlighting the latter. There are additional comments by Michael Pollack, M.D., his fellow in 2002-2003 at the time remplissage was being developed and a co-author on the original publication.

Dr. Wolf begins:

“Detachment of the labrum was presumed to be the essential lesion from when Bankart reported this in 1923. Frank Jobe, M.D. was the first to use an anchor on the labrum in an open surgery in a professional baseball player. I had a sincere interest in adapting this to an arthroscopic approach. Dick Lynch at Mitek was asked to make longer instruments to pass through a cannula. I developed a threaded cannula to assist with this.

“For the first arthroscopic Bankart, I was happy enough to be able to reattach the labrum up onto the rim, using three anchors. This did not account for any capsular damage. The next iteration was to plicate the capsule to simulate a capsular shift. The rotator interval closure, by backing out the cannula and closing the aperture with a No. 1 PDS, was the next step.

“There were still circumstances which lead to an unacceptable rate of recurrence. Louis Bigliani, M.D. suggested the Hill-Sachs lesion plays a role. I considered options to approach this arthroscopically. I recalled the posterior cuff and capsule were conjoined laterally. It occurred to me to tenodesis and capsulodesis these tissues into the defect. In my first attempt, viewing from the anterosuperior cannula, I was able to view the Hill-Sachs lesion.”

Dr. Wolf used an absorbable PLA screw and washer for the first case. After a few more cases, a patient returned with pain and he took out the screw at about six months post-op. He considered rotator cuff anchors, given the hard bone. As a proof of concept, six cadavers were used to see the location to fill the defect best. The most inferior suture could be in the teres minor. With this, rotator cuff anchors were introduced into the technique. It was decided to place the anchors “a little more lateral so not to shorten the posterior capsule.” The Bankart was prepared first but not repaired ... “the opposite of now.”

Dr. Wolf continues:

“I freshened the bone using a burr on reverse. Two single-loaded rotator cuff anchors were used, one more superior and one more inferior in the medial portion of the Hill Sachs defect. The posterior cannula was backed out. If the cannula was not directly across the anchors in the Hill-Sachs defect with the arm in neutral rotation, a spinal needle was used to replace the portal and a large cannula was replaced there. A straight penetrator was passed blindly. The inferior suture was tied first, then the superior suture. The Bankart repair was then finished. I wasn't sure if it would work. At six months out, I got MRIs to show healing in the defect.”

Dr. Wolf didn't have a name for the procedure yet. He went to medical school in Bordeaux and considered a name for his Hill-Sachs stuffing or filling. French for filling a void, glass or tank is remplissage. "I didn't know it would become a staple, though it turned out to be my career 'holy grail'."

In addition to recalling the above, Dr. Pollack added the following:

"I found an open analog for arthroscopic remplissage by Connolly in a 1972 American Academy of Orthopaedic Surgeons Instructional Course Lecture, as a reverse McLaughlin procedure. As Dr. Wolf intuited, there was already clinical justification and precedent that an infraspinatus/posterior capsular tenodesis would have efficacy for stabilizing the shoulder. The concept of rendering the intra-articular Hill-Sachs lesion extra-articular, and thus preventing engagement of the Hill-Sachs lesion, was Dr. Wolf's direct answer to De Beer and Burkhart's landmark article about the substantially higher recurrence rates for the subset of shoulders with bony deficits. Remplissage also has the virtue of providing a direct posterior tenodesis effect as you can see so clearly when you tension and tie the stitches under arthroscopic visualization from the anterosuperior viewing portal that Dr. Wolf also pioneered. Dr. Wolf's thesis and elegant, straightforward technique still holds water, demonstrates the power of innovation and has become a mainstay in our armamentarium for treating shoulder instability."

So, that's the story. And, we hope you enjoy reading some of the classical references, which speak for themselves. In the future, more historical content is planned for our *Inside AANA* eNewsletter. If you have any feedback, email us at [info@aana.org](mailto:info@aana.org) and add "REPLISSAGE" in the subject line. Thanks.

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References *Direct links to historical references included.*

1. Bankart, A.S.B. (1923). "[Recurrent or Habitual Dislocation of the Shoulder Joint.](#)" *The British Medical Journal*, 2:1123-33.
2. Burkhart, S.S., De Beer, J.F. (2000). "[Traumatic Glenohumeral Bone Defects and Their Relationship to Failure of Arthroscopic Bankart Repairs: Significance of the Inverted-Pear Glenoid and the Humeral Engaging Hill-Sachs Lesion.](#)" *Arthroscopy*, 16:677.
3. Connolly, J.F. (1972). "[Humeral Head Defects Associated With Shoulder Dislocation – Their Diagnostic and Surgical Significance.](#)" Instructional Course Lecture, 21:42-54.
4. Hill, H.A., Sachs M.D. (1940). "[The Grooved Defect of the Humeral Head: A Frequently Unrecognized Complication of Dislocation of the Shoulder Joint.](#)" *Radiology*, 35:690-700.
5. McLaughlin, H.L. (1952). "[Posterior Dislocation of the Shoulder.](#)" *Journal of Bone and Joint Surgery*, 34(3):584-90.

6. Purchase, R.J., Wolf, E.M., Hobgood, E.R., Pollack, M.E., Smalley, C.C. (2008). "[Hill-Sachs "Remplissage": An Arthroscopic Solution for the Engaging Hill-Sachs Lesion.](#)" *Arthroscopy*, 24:723-6.
7. Wolf, E.M., Wilk, R.M., Richmond, J.C. (1991). "[Arthroscopic Bankart Repair Using Suture Anchors.](#)" *Operative Techniques in Orthopaedics*, 1:184-91.
8. Wolf, E.M. (1989). "[Anterior Portals in Shoulder Arthroscopy.](#)" *Arthroscopy*, 5:201-8.
9. Wolf, E.M., Arianjam, A. (2014). "[Hill-Sachs Remplissage: An Arthroscopic Solution for the Engaging Hill-Sachs Lesion: 2- to 10-year Follow-Up and Incidence of Recurrence.](#)" *Journal of Shoulder and Elbow Surgery*, 23:814-20.
10. Wolf, E.M., Pollack, M., Smalley, C. (2007). "Hill-Sachs "Remplissage:" An Arthroscopic Solution for the Engaging Hill-Sachs Lesion (SS-02)." *Arthroscopy*, 23:e1-e2.
11. Wolf, E.M., Pollack, M.E. (2004). "Hill-Sachs "Remplissage": An Arthroscopic Solution for the Engaging Hill-Sachs Lesion (SS-32)." *Arthroscopy*, 20:e14-e15.