PANACRYL™ Absorbable Suture

A roundtable discussion on the long-term braided synthetic absorbable suture offered by Mitek® Products and ETHICON, Inc.

In February 1998, Mitek Products introduced PANACRYL™ Absorbable Suture with its PANALOK® Absorbable Anchor. Later that year, the absorbable suture product became available with the PANALOK RC Absorbable Anchor and now with the company's line of metallic suture anchors. Made of polylactic acid (PLA)/Glycolide (PGA), the suture is the industry's first and only *long-term braided* synthetic absorbable suture. As such, it opens up new opportunities for use in soft-tissue repair.

Other ETHICON synthetic absorbable sutures on the market include PDS® II (Polydioxanone) and VICRYL® (Polyglactin 910). Each of these sutures maintains different levels of strength over time and absorb at a different rate. PANACRYL suture exhibits by far the longest strength profile over time, retaining 80% of its original strength through three months. The roundtable discussion that follows, moderated by Dr. Felix H. Savoie, presents the current thinking of leading orthopaedic surgeons who have had firsthand experience with PANACRYL Suture in their practice.

Mitek Products is providing this roundtable discussion as a service to the medical community. The medical opinions, procedures, and treatments outlined by the participants are their own.

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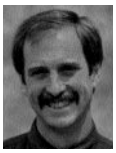
Moderator



Felix Savoie, M.D.
Jackson, Mississippi

Panelists

David Altchek, M.D.
New York City, New York

Klaus Dann, M.D.
Vienna, Austria

Stephen Liu, M.D.
Los Angeles, California

George McCluskey, M.D.
Columbus, Georgia

Lonnie Paulos, M.D.
Salt Lake City, Utah

Dean Sotereanos, M.D.
Pittsburgh, Pennsylvania

Savoie

According to Mitek, PANACRYL Suture is unique in that it retains 80% of its strength through three months. Let's start by describing what, if any, advantage this offers you over other absorbable sutures.

McCluskey

The first six weeks is a vulnerable time for tendon healing to bone and might very well place the repair in jeopardy. Most absorbable sutures have an inadequate absorption time and lose too much of their strength too soon. In my opinion, long-term strength is not just an advantage, it's a necessity.

Paulos

Yes, obviously having 80% strength retained beyond six weeks is significant. Six weeks is only a marginal amount of time to have soft tissue heal, either to bone and/or [to] itself. By allowing the suture strength to go beyond three months, those patients who are slower in healing and/or are somewhat more active early have a safety [margin] which other absorbable sutures don't offer.

Altchek

The obvious advantage of a longer degradation time is that it minimizes the risk that the repair site will fail prior to biologic healing.

Savoie

. . . I also find that the longer the tissue is held in place adequately, especially in younger patients, the more likely it is that the tissue will heal and be able to resist early injury.

Dann

I like the strength of this suture, especially when used with a PANALOK RC anchor. At the moment PANACRYL is the only long-term braided absorbable suture on the market. Combined with the PANALOK anchor, I feel quite safe [in] refixat[ing] the capsulolabral complex with this kind of system and I can start the physiotherapy and mobilization of the shoulder three weeks postoperatively without fear of the suture breaking.

Savoie

We seem to have a consensus about the benefits of absorbability, but what is your experience with rotator cuff repairs? How does PANACRYL Suture compare with a braided polyester suture?

Sotereanos

Well, its longevity is one thing . . . but the real advantage is the absorption. I have had many patients complain of discomfort with braided polyester suture. This isn't the case with PANACRYL Suture . . . which does eventually absorb.

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PANACRYL™ Suture Roundtable Dis

McCluskey

I think the PANACRYL Suture offers significant advantages over the braided polyester suture of the same size, especially in rotator cuff repairs.

Savoie

Okay, but can you be more specific?

Paulos

Nonabsorbable polyester sutures can be a problem in the knee, shoulder, and other joint ligament surgeries. First of all, as we said, many times sutures become irritating underneath the skin or near moving bursae or tendinous structures. This sometimes necessitates removal and secondary surgery, whereas this [suture] will not. When the surgeon has to repeat a surgical procedure, the suture material that is still present in the wound and around previous ligament repairs will require extended surgical time for removal and can harbor indolent bacterial contamination.

Altchek

Yes. By absorbing, patients are left with their normal tissue, without irritation from a foreign object. PANACRYL Suture minimizes the chance of post-operative knot impingement.

Savoie

What about artifacts?

Liu

Yes, this is another issue. I've used PANACRYL Suture extensively for over a year now and with much satisfaction. I have found that the healing response of tendon to tendon or tendon to bone can be depicted nicely in MRIs after all materials have biodegraded, at around six to nine months. Nonabsorbable sutures make post-op MRI study vague with artifacts. With absorbables, there is no residual metallic or plastic foreign body and the revision surgery is less demanding. There is also less chance of permanent floating loose anchors, and they do not show on x-rays.

Savoie

Then there's the patient's perspective. My patients respond quite positively when they learn they will be left with only their own tissue and without permanent foreign materials in place. Okay, is there any advantage in using PANACRYL Suture in conjunction with an absorbable or metallic suture anchor?

Sotereanos

When an absorbable anchor is used, the advantage to my patients is a safe, bioresorbable product line. Patients are very interested in this.

McCluskey

I feel that there is a distinct advantage in using PANACRYL Suture in conjunction with an absorbable or [a] metallic suture anchor. The combination of an absorbable suture that maintains its strength for a prolonged period along with an absorbable suture anchor is, of course, the ideal combination. . . The problem with the metallic suture anchor or nonabsorbable suture is that it will forever be present in the tissues.

Liu

I am in favor of absorbable products, so I'm biased toward absorbable suture anchors.

Paulos

The use of an absorbable suture with metal anchors seems illogical to me. A totally absorbable system is far superior to leaving metal anchoring devices in the bone, which may subsequently require removal if an infection occurs or become space-occupying objects if revision surgery is necessary. With the development of absorbable anchors, the nonabsorbable suture anchors, metallic or nonmetallic, have been made obsolete.

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Savoie

Let's discuss the handling and tying characteristics of the PANACRYL Suture. How do you find it?

Sotereanos

It's an ideal suture to handle. It slides nicely. It's smooth and strong.

Dann

I think it's got better handling for slip knots.

Altchek:

It's much easier to handle and tie than braided polyester suture.

Savoie

Interesting . . .

McCluskey

In my experience, PANACRYL is a smooth, soft suture that is quite easy to handle and passes easily through soft tissue. I find it much easier to tie than the braided polyester suture, and it gives a less bulky and firm knot while maintaining excellent strength.

Savoie

Do you agree?

Paulos

Yes, the tying characteristics are excellent. Knots lay down flat, hold tension, and are superior to monofilament sutures . . . whether they're absorbable or nonabsorbable. However, the handling characteristics are somewhat trickier than with braided polyester or braided absorbables, such as VICRYL Suture. Because the suture is "somewhat softer," it is necessary to tie snugly without over-pulling.

Savoie

Would you use PANACRYL Suture as a substitute for both absorbable and nonabsorbable suture?

Liu

I placed one of the first PANALOK-PANACRYL suture anchor system in this country about a year ago. Since then I have used PANACRYL Suture extensively and I am very pleased with the results.

Dann

Yes, I will use the PANACRYL Suture in the future as a substitute because the long-term absorption guarantees me an excellent refixation. I really don't see a need for nonabsorbable sutures in refixation of soft-tissue injuries.

Altchek

PANACRYL Suture has the obvious advantage of ultimate absorption while preventing early degradation prior to biologic healing.

McCluskey

I prefer PANACRYL Suture to other absorbable sutures because it maintains its original strength much longer. This is critical in rotator cuff and labral repair surgery because of the longer healing times required for more secure and mature tendon fixation to bone. I have no hesitation in using PANACRYL Suture as a substitute because of its prolonged strength (80%) at three months following surgical repair. This is ample time for soft-tissue healing to occur.

Sotereanos

PANACRYL Suture is stronger and the fact that it is absorbable makes it more comfortable, especially in thin patients.

Paulos

I really believe PANACRYL is the suture of the future. It will replace absorbables and nonabsorbables. I do not see the necessity of using nonabsorbable sutures now that PANACRYL Suture is available. With the development of PANACRYL Suture, the distinction between absorbable and nonabsorbable sutures will be slowly erased.

Savoie

Any final comments about PANACRYL Suture or Mitek Products?

Liu

PANACRYL Suture is a biological product that is here to stay. I have used it extensively, and have not found any reactive synovitis or inflammation from its use that would compromise my patient care or tissue repair. My follow-up MRI study of rotator cuff repair confirms this.

Paulos

When using the PANACRYL Suture with PANALOK suture anchors, it is important that the bone hole not abraid the suture while the anchor is inserted. If caution is taken during the insertion of the anchor, then the system works perfectly well. However, if the suture is slightly abraided during the insertion of the anchor . . . it will break. That said, I'm excited about the development of the PANACRYL Suture and look forward to more varieties and different configurations becoming available.

Sotereanos

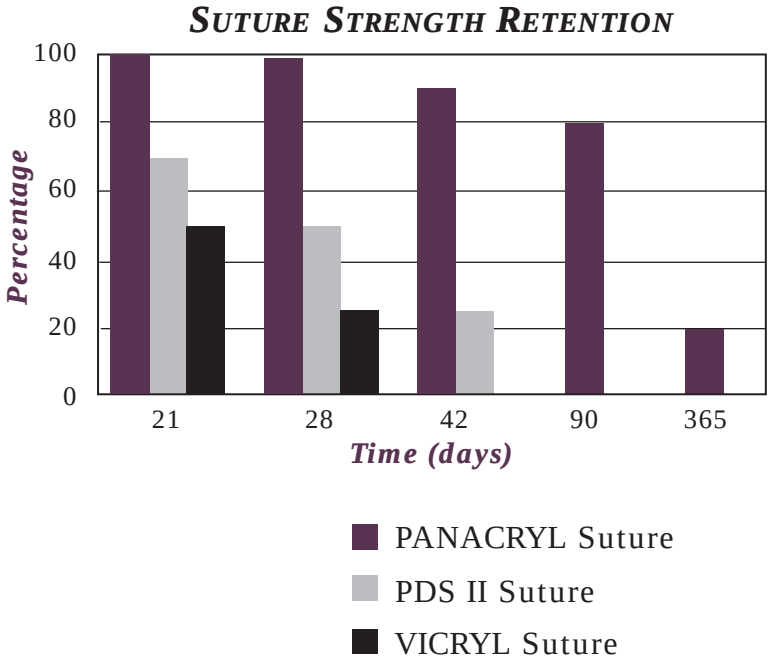
These products offer ease of application, strength, and cutting-edge technology.

McCluskey

Mitek has enhanced my shoulder surgical practice tremendously with products that include the PANALOK 3.5 and RC absorbable anchors used in combination with the PANACRYL Suture. These anchors are versatile and reliable in all situations. This has been untrue of other suture anchors that I have used. It is convenient to use one system in patients with hard bone and in older patients with soft bone.

Savoie

Thank you, gentlemen.



Felix H. Savoie, M.D.

F. H. "Buddy" Savoie received a bachelor of science degree from Louisiana State University and his medical degree from Louisiana State University School of Medicine in New Orleans. He completed a surgical internship and an orthopaedic surgical residency at the University of Mississippi Medicine Center, where he received special training in trauma. He subsequently completed a trauma fellowship with F. Harder, M.D., Basel, Switzerland; a hand and microvascular fellowship with John Gould, M.D., at the Medical College of Wisconsin; and an arthroscopic fellowship with Drs. Richard Caspari, John Meyer, and Terry Whipple in Richmond, Virginia. Author of scores of articles on arthroscopic surgery, Dr. Savoie has presented extensively and contributed widely to surgical texts.

Dr. Savoie is a clinical associate professor of orthopaedic surgery at the University of Mississippi Medical Center and on the editorial board for *The Journal of Arthroplasty.* Currently, he codirects the Upper Extremity Fellowship at the Mississippi Sports Medicine and Orthopaedic Center.

Stephen H. Liu, M.D.

Stephen H. Liu graduated from the University of California, Los Angeles (UCLA), with an honors bachelor of science in 1982. He received his medical degree from the University of Southern California followed by an orthopaedic surgical residency and fellowship in sports medicine at the Hughston Orthopaedic Clinic in Columbus, Georgia. A prolific researcher whose work has been published in well over 100 articles, abstracts, and book chapters, Dr. Liu has presented extensively on arthroscopic procedures of the knee and shoulder throughout the world. Dr. Liu is currently an assistant professor in the Department of Orthopaedic Surgery at the UCLA School of Medicine and is a reviewer for several key orthopaedic journals, including *Clinical Orthopaedics and Related Research*, the *American Journal of Sports Medicine*, and *Journal of Bone and Joint Surgery*.

Lonnie E. Paulos, M.D.

Lonnie E. Paulos received a bachelor of science degree and medical degree from the University of Utah. He completed an internship at the University of Texas Southwestern's Parkland Memorial Hospital and went on to complete his residency in orthopaedic surgery at the University of Utah School of Medicine. Dr. Paulos was a clinical fellow at the Atlanta Sports Medicine Foundation and the University of Cincinnati Medical Center. A member of many national and international editorial boards, he has published and presented well over 300 articles and book chapters dealing with sports-related injuries and arthroscopy.

Dr. Paulos has lectured widely and has held professorships at the University of Utah School of Medicine's Department of Orthopaedic Surgery and at the University of Cincinnati Medical Center. He currently consults with the U.S. Freestyle Ski Team; is medical director of the Orthopedic Biomechanics Institute; and is in private practice in Salt Lake City. He is a former consultant to the Professional Spring Football League.

David Altchek, M.D.

David Altchek received a bachelor of arts degree from Columbia College and his medical degree from Cornell University Medical College in Manhattan. He did a surgical internship at New York Hospital and then went on to complete his training as an orthopaedic surgeon at the Hospital for Special Surgery, where he did an orthopaedic residency as well as specialty training in Sports Medicine. Dr. Altchek is an Associate Attending Orthopaedic Surgeon at the Hospital for Special Surgery where he has been in practice since 1988, specializing in surgery for sports-related injuries of the shoulder, elbow, and knee.

At present, he is the team physician for the New York Mets as well as the medical director for the men's professional tennis tour — the ATP Tour. He serves as a member of the USTA Sports Science Committee.

Klaus Dann, M.D.

Klaus Dann received his medical degree in 1982 and is a staff member of the Department of Traumatology & Sportstraumatology at Wilhelminenspital in Vienna. Born in Stuttgart, Germany, he is an Austrian citizen who completed his degree in medicine in 1982. Dr. Dann has undertaken residencies in the Department of Cardiology, Anesthesiology, Neuro-Surgery, Reconstructive Surgery, Traumatology, and Orthopedic Surgery in Austria and Switzerland. His area of interest is arthroscopic shoulder and knee surgery — topics on which he's written and presented in Switzerland, Germany, Austria, the U.S., Japan, and South Korea.

Vice President of GOTS (Gesellschaft Für Orthopädisch Traumatologische Sportmedizin), Dr. Dann consults to the International Snowboard Federation and has written many articles dealing specifically with snowboard-related injuries.

George M. McCluskey, M.D.

George Milton McCluskey III graduated with an honors bachelor of science from Auburn University and received his medical degree from the Medical College of Georgia. He did an internship at Charity Hospital of Louisiana and went on to complete his orthopaedic surgical residency at Tulane University School of Medicine, where he became chief resident. Having received several fellowships for study of the shoulder and elbow in New York, Dr. McCluskey returned to Columbus, Georgia, where he is now the director of the Hughston Shoulder Service as well as a staff surgeon at Hughston Sports Medicine Hospital and The Medical Center, among other affiliations. Dr. McCluskey also teaches at Tulane University School of Medicine and Emory University School of Medicine. He has published and presented well over 100 articles on the shoulder and on sports-related injuries and serves on the editorial board of several publications.

Dr. McCluskey is currently shoulder consultant to the Columbus Cottonmouths, a professional hockey team. He also consults to the minor league franchise of the Cleveland Indians, the Columbus RedStixx, and the Columbus State University.

Dean Sotereanos, M.D.

Dean Sotereanos received a bachelor of science degree with highest honors from the University of Pittsburgh in 1980 and his medical degree from Hahnemann University four years later. An intern at the University of Pittsburgh, he completed his residency there with Dr. Jim Herndon. His postgraduate studies were in hand and microvascular surgery at Duke University Medical Center with Dr. Jim Urbaniak. Dr. Sotereanos holds staff positions at several hospitals throughout the Pittsburgh area and is currently chief of hand and upper extremity surgery at the Veterans Administration Medical Center and the Department of Orthopaedic Surgery at the University of Pittsburgh, where he also holds professorships.

A member of the national Hand Committee of the American Academy of Orthopaedic Surgery in 1998 and now program chairman of the Pennsylvania Orthopaedic Society, Dr. Sotereanos has written many articles on surgical technique for the *Journal of Hand Surgery*, the *American Journal of Reconstructive Microsurgery*, and *Clinical Orthopaedics and Related Research*.

This roundtable discussion was convened and published through a grant from Mitek Products and ETHICON, Inc.

PANACRYL suture is indicated for use in general soft-tissue approximation and/or ligation, and orthopaedic uses including tendon and ligament repairs and reattachment to bone but not for use in ophthalmic, cardiovascular, or neurological tissue. PANACRYL suture is particularly useful where extended wound support (up to 6 months) is desirable.

PDS II monofilament synthetic absorbable suture is indicated for use in all types of soft-tissue approximation, including use in pediatric cardiovascular tissue where growth is expected to occur and ophthalmic surgery. PDS II suture is not indicated in adult cardiovascular tissue, microsurgery, and neural tissue. This suture is particularly useful where the combination of an absorbable suture and extended wound support (up to 6 weeks) is desirable.

Coated VICRYL (polyglactin 910) suture is indicated for use in general soft-tissue approximation and/or ligation, including use in ophthalmic procedures, but not for use in cardiovascular and neurological tissues.

Mitek PRODUCTS

Mitek Products, Division of ETHICON, Inc.
60 Glacier Drive, Westwood, Massachusetts 02090 • www.mitek.com

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