

SWANSON Finger Joint



TECHNICAL MONOGRAPH

SWANSON
finger JOINT

PERFORMANCE CHARACTERISTICS
AND THIRTY (PLUS) YEAR CLINICAL SUCCESS

technical monograph

SWANSON

finger JOINT

PERFORMANCE CHARACTERISTICS
OF THE SWANSON FINGER JOINT

introduction

THIRTY (PLUS) YEARS OF CLINICAL SUCCESS

The SWANSON silicone finger joint has been commercially available since 1969, and is the only interpositional finger device that has thirty years of documented data describing its clinical success. The sheer number of devices implanted (>500,000) dwarfs all competitive implants. This literature review on the Swanson silicone finger implant details the clinical history of the device as reported by independent surgeons in the orthopedic community.



PRE-OP



POST-OP



COMPLICATION RATES

In 1995, Donna Foliart, MD, published a literature review of complications reported with SWANSON silicone finger implants from 1971 through 1994. This 23-year clinical data and 15,556 joint review | **FIGURE 1** found that the complication rate resulting from implantation of silicon implants is very low.

The summary data as presented by Dr. Foliart is as follows:¹

COMPLICATION	NO./TOTAL	RATE (%)
Particulate synovitis	10/15,556	0.06
Lymphadenopathy	13/15,556	0.08
Bone Changes	577/15,556	4
Implant Fracture	352/15,556	2
Implant Loosening	114/15,556	0.7
Infection	86/15,556	0.6
Implant Removal	164/15,556	1

FIGURE 1 |

SURGICAL RESULTS

McArthur and Milner report | **FIGURE 2** on 31 SWANSON implants in the metacarpal (MCP) joint at 6 months and 12 months follow-up with the following results:²

	PRE-OP	6 MO. POST-OP	12 MO. POST-OP
Arc of motion (°)	29	44	37
Grip strength (kg-F)	3.0	4.4	6.0
Extension deficit (°)	47	18	23

FIGURE 2 |

They additionally reported that none regretted having surgery and that the patients were “satisfied with the results of the surgery.”

Kirschenbaum *et al.* published their results | **FIGURE 3** on 144 SWANSON devices in the metacarpals with the following data at 4 months and 8.5 years average follow-up:³

	PRE-OP (Averaged)	4 MO. POST-OP (Averaged)	CLINICAL FOLLOW-UP (Averaged)
Arc of motion (°)	27	48	44
Extension deficit (°)	47	18	23
Ulnar deviation (°)	28	3	7

FIGURE 3 |

Wilson *et al.* report on 375 joints implanted between 1976 and 1985, with 185 of these joints receiving in-office objective evaluation between 5 and 14 years post-operatively with an average follow-up of 9.6 years.⁴ The average arc of motion was 29° at the time of follow-up in right and left hands with an average extensor lag of 24° in right hands and 19° in left hands. This compares to the immediate post-operative arc of motion and extensor lag values of 46° and 9° respectively.

Wilson and colleagues also assessed 48 patients with 246 joints via postal questionnaire. Ninety-six percent of those patients were “convinced that there had been definite improvement in the first year following their operation...of those that had felt that there had been improvement, 70% felt that this had been maintained long-term. The remaining 30% felt that any deterioration was attributable to increasing stiffness leading to loss of movement, rather than due to a return of pain.” The authors concluded that even though the range of motion decreases over time, patients considered their results successful with pain relief, correction of ulnar drift and subluxation, and improved range of motion. The authors

state, “Patients and surgeons can be confident in its long-term reliability and the functional benefits are consistent.”

Harris Gellman *et al.* followed 264 rheumatoid patients | **FIGURE 4** with 901 Swanson implants at an average follow-up of 8 years.⁵ Their results are summarized as follows:

	PRE-OP	CLINICAL FOLLOW-UP
Arc of motion (°)	40	50
Extension deficit (°)	50	10
Ulnar deviation (°)	45	15

FIGURE 4 |

Pain was assessed using Revill’s linear analog scale of 0-10, and was reported as 2.9 pre-operatively and had decreased to 1 post-operatively. The authors concluded that while “most patients have no measurable improvement in strength, most subjectively think their function is improved.”

A retrospective review of 170 MCP and 99 (proximal interphalangeal) PIP joints was conducted by Kenneth Hansraj, M.D. with follow-up averaging 5.2 years and 5.8 years respectively for the MCP and PIP.⁶

Subjective pain was evaluated, and 67% reported having no pain and 28% reported slight pain in the PIP. Similarly for the MCP, 54% reported no pain and 39% reported slight pain. The remaining 7% were divided between 3% moderate pain, and 4% severe pain. Dr. Hansraj is quoted as saying: “Each device is extremely durable, provided that you achieve good alignment, balance the soft tissues and make careful bone cuts ... pain relief is dramatic and long term functional results are good.”

Survivorship data was reported as “95% success rate at 5 years, 93% at 7 years, and 90% at 10 years” for the MCP. Hansraj also commented that the movement of the stem “distributes load over a broader section of the bone.” Additionally, “the device’s low modulus of elasticity makes it softer than bone and provides force-dampening characteristics that further protect bone and soft tissue.”

Schmidt *et al.* assessed 57 joints at 3.5 years average follow-up, 91 joints at 4.3 years, and 102 implants at 10.1 years.⁷ **FIGURE 5** The 3.5-year follow-up group additionally utilized grommets with the devices. The results reported in the abstract are as follows:

	PRE-OP	3.5 YEAR (Follow-Up)	PRE-OP	4.3 YEAR (Follow-Up)	PRE-OP	10.1 YEAR (Follow-Up)
Arc of motion (°)	33	42	38	37	42	36
Extension deficit (°)	45	18	32	11	33	11
Ulnar deviation (°)	22	8	23	7	34	12

FIGURE 5 |

Functional improvement of the hand was seen in 82% of the 4.3-year follow-up group and 75% of the long-term patients. “Nearly all patients reported a marked relief of pain.” They go on to say that “the additional use of titanium grommets...seems to reduce reactive osteolysis and prevents Swanson [silicone] spacers from breakage without substantial influence on the clinical outcome.”

It is important to note that early clinical data generally shows more favorable results due to more attentive physical therapy and long term affects of the disease.

PIP/DIP

In addition to the SWANSON silicone finger implant’s documented success in the metacarpal, the SWANSON device is the only currently available implant that has sizing appropriate for the PIP and the DIP as well.

Iselin and Conti report on 238 SWANSON devices used in the PIP between 1970 and 1990.⁸ Their study contains data on 238 joints with short-term follow-up between 1-2 years, and long term follow-up of between 5 and 23 years for 25 joints. Based on their findings, the authors concluded, “the results obtained at 12 months are likely to remain at 12 years.” They additionally state that “resection arthroplasty with a silicone implant remains a valuable solution to treat PIP joint stiffness.”

E. F. Shaw Wilgis reported on SWANSON implant usage in the distal interphalangeal (DIP).⁹ 38 implants were implanted in 23 patients over 11 years to preserve motion and provide stability at the DIP joint. Follow-up for the 28 long-term cases reviewed averaged 10 years. The mean extension lag averaged 12.7° and active range of motion averaged 33° with an average range of 10-50°. 71% had improved strength while

81% had “augmented dexterity.” Dr. Wilgis states that the patients unanimously thought pain was relieved and were “highly satisfied” with the appearance of the finger and felt that “power and dexterity were sufficient.” Wilgis concludes, “silicone joint arthroplasty is an effective procedure that can be used as an alternative to arthrodesis in selected patients,” and additionally offers the advantage of preservation of motion and stability of the DIP.

CONCLUSION

The SWANSON silicone finger implant was designed to relieve pain, restore function, and improve the quality of life of those affected by arthritis. The body of literature conclusively supports that this device has accomplished this feat and remains the gold standard of care for treatment of arthritis of the metacarpals, and is also useful in the surgeon’s armamentarium for treatment of the stiff proximal and distal interphalangeal joints.

REFERENCES

1. Foliart, DE. "Swanson silicone finger joint implants: a review of the literature regarding long-term complications." *Journal of Hand Surgery* 1995; 20A: 445-9.
2. McArthur, PA, Milner, RH. "A prospective randomized comparison of Sutter and Swanson silastic spacers." *Journal of Hand Surgery* 1998; 23B: 574-7.
3. Kirschenbaum, D, Schneider, LH, Adams, DC, Cody, RP. "Arthroplasty of the metacarpophalangeal joints with use of silicone-rubber implants in patients who have rheumatoid arthritis." *Journal of Bone and Joint Surgery* 1993; 75A:3-12.
4. Wilson, YG, Sykes, PJ, Niranjana, NS. "Long-term follow-up of Swanson's silastic arthroplasty of the metacarpophalangeal joints in rheumatoid arthritis." *Journal of Hand Surgery* 1993; 18B: 81-91.
5. Gellman, H, Stetson, W, Brumfield, RH, Jr., Costigan, W, Kushner, SH. "Silastic metacarpophalangeal arthroplasty in patients with rheumatoid arthritis." *Clinical Orthopaedics and Related Research* 1997;342: 16-21.
6. Edelman, B. "Swanson MCPs, PIPs endure test of time." *Orthopaedics Today*, 1993: 8: 1-3.
7. Schmidt, K, Witt, K, Ossowski, A, Miehke, RK. [Therapy of rheumatoid destruction of the middle finger metacarpophalangeal joint with a Swanson silastic implant stabilized resection arthroplasty: comparative study of long and intermediate term results with and without implantation of titanium grommets]. German article, English abstract. *Z Rheumatol*, 1997 Oct; 56(5):287-97.
8. Iselin, F, Conti, E. "Long-term results of proximal interphalangeal joint resection arthroplasties with a silicone implant." *Journal of Hand Surgery* 1995: 20A: S95-S97.
9. Wilgis, EFS. "Distal Interphalangeal Joint Silicone Arthroplasty of the Hand." *Clinical Orthopaedics and Related Research* 1997:342: 38-41.



Wright Medical Technology, Inc.

5677 Airline Road
Arlington, TN 38002
901.867.9971 phone
800.238.7188 toll-free
www.wmt.com

Wright Medical Europe SA

Rue Pasteur - BP 222
Zone d'Entreprise de La Farlède
83089 TOULON Cedex 9
France
+33 (0)4.94.08.77.88 phone