

# Precision in Minimal Access Laparoscopic Surgery: 3D Printing Custom SILS Ports

## Dr . Prem Kumar A

(Professor and head of unit Department of General Surgery)

Laparoscopy is an operation performed in the abdomen or pelvis using small incisions with the aid of a camera. The laparoscope aids diagnosis or therapeutic interventions with a few small cuts in the abdomen. For laparoscopic surgery SILS ports are used which provides multiple access port and designed to perform surgery through a single incision, as well as through the anus to provide access for rectal procedures such as TEMS (Transanal Endoscopic Micro Surgery)

Though, there were some challenges with the SILS port available which had been identified by Dr Prem Kumar A (Professor and head of unit Department of General Surgery) and Dr Nikhil S Reddy (Final Year MS Surgery Resident, Department General Surgery) from Victoria Hospital Bangalore.



Dr. Prem Kumar A  
(Professor and head of unit  
Department of General Surgery)



Dr. Nikhil S Reddy  
(Final Year MS Surgery Resident,  
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Challenges: Conventional Laparoscopy SILS ports have a disadvantage of fixed port size, difficult instrumentation due to close placement of ports, and C2 leak in periportal site.

Objective of study: To use minimal access to rectal surgery using SILS port. Device will be tested on set of patients who have rectal problem.

"It has been a great experience working with Altem, The case study which has been conducted with help of Altem has benefited the patients and set a milestone in surgical field. The research will set precedence for future studies and enhance the capabilities of the surgical science."

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Solution: Dr. Nikhil, comprehended the problem statement, and connected to ALTEM Technology Pvt Ltd, Bangalore who offered a solution with 3D Printing Technology. They 3D scanned a sample SILS Port using the Artec Space Spider 3D Scanning machine and made necessary modifications using Geomagic Design X under the guidance of Dr. Nikhil. The final design was printed in Stratasys 3D Printer based on Polyjet Technology, where they had the freedom to vary the Shore A values (surface flexibility ) to identify the accurate elastomer property required to sustain during surgery and rectify the challenges stated above.

Polyjet 3D Printer model got tested for live surgery and achieved successful results. This initiative by Dr.Prem Kumar and Dr.Nikhil S Reddy of Victoria hospital, Bangalore has given a new way to approach rectal conditions using laparoscopic surgery and overcome the above stated challenges by making customized ports using 3D printing.

# About Altem Technologies Pvt. Ltd

Altem Technologies is a well-established 3D digital experience company that has been actively contributing to the industry for nearly 15 years. Initially rooted in PLM software and 3D Printing, Altem has successfully transformed into a prominent provider of comprehensive 3D digital solutions. Altem's 3D Innovation platform offers an extensive array of products catering to various applications, including design, reverse engineering, asset digitization, prototype manufacturing, life science, healthcare, culture and heritage, and consultancy services, among others.

With a diverse clientele spanning automotive, aerospace, manufacturing, healthcare, research academia, and more, Altem adeptly addresses the unique requirements of each industry through a combination of expertise and innovation. Our team comprises skilled professionals, including Scientists, Application Engineers, Designers, domain experts, and software specialists, all working collectively to deliver exceptional solutions to our valued customers.

Altem Technologies Pvt Ltd, besides being a major provider of 3D Scanning services in India, is also a leading provider of 3D Printing Services in India with 3D Printing technologies like FDM, Polyjet, DLP, Metal, etc. Altem offers a complete solution around 3D Digitization and Innovation, and has emerged as a one-stop-shop for all 3D Printing, 3D Scanning, CAE, PLM, and Life Sciences needs, offering a wide spectrum of products for engineering and life sciences companies in India