Surgical Implant 3D

POLYJET TECHNOLOGY OPENS NEW DOORS FOR SURGICAL IMPLANT 3D

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– Nicolas Jager, Founding Partner, Surgical Implant 3D.

CASE STUDY

3D printing allows Surgical Implant 3D to bring digital designs to life with precision and accuracy.

THE ROOT OF THE PROBLEM

Surgical Implant 3D has always aspired to use the latest technologies and devices to manufacture dental solutions, more specifically surgical guides, for its patients. However, only a few specialist manufacturers make surgical guides, limiting the options for outsourcing their production. These companies use Stereolithography (SLA), a 3D printing technology, to make the guides, which presents problems.

"The SLA parts we outsourced offered a significantly inferior level of resolution than the optical scanner we used to deliver a detailed scan of the patient's mouth," Nicolas Jager, Surgical Implant 3D Founding Partner, explains.

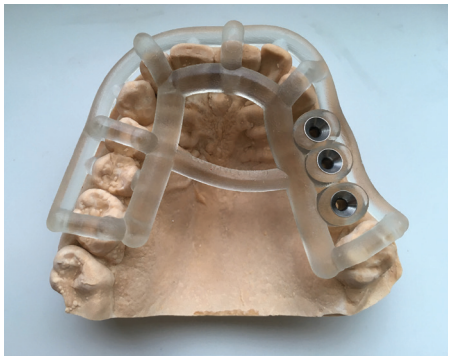
“At the time, the SLA parts we received had a resolution of 150 micron layers, while the optical scanner provided a virtual 3D molding of the mouth to an accuracy of five micron layers. As a result, the surgical guides did not always fit precisely in the patient’s mouth and, in the worst-case scenarios, their instability during surgery made drilling work less accurate.” These inadequacies resulted in more difficult surgeries and long lead times.

Finding the Filling

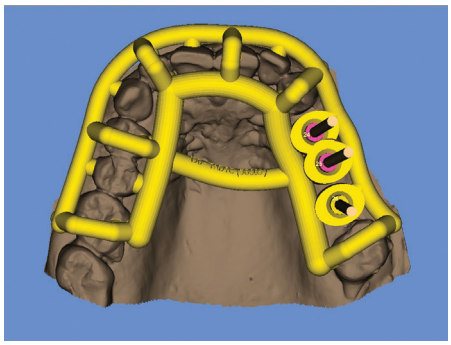
Looking for an alternative 3D printing solution, Jager began talks with engineers from a subsidiary to SMOP, a virtual planning software that delivers improved bespoke surgical guides. Using SMOP, the jaw is recreated in 3D and dental implants can be positioned with exceptional accuracy. Impressed with the new benefits offered by the solution, Surgical Implant 3D began ordering its surgical guides from SMOP providers in conjunction with Stratasys PolyJet™ 3D printing technology.

“The resolution of PolyJet is outstanding and compatible with the optical scanner and 3D printing CAD software,” states Jager. By outsourcing PolyJet-printed surgical guides, the implant surgery greatly improved, since the prototypes offered higher precision and perfect fittings.

Jager was also satisfied by the reduction in production time saying, “It used to take three weeks to receive our 3D printed SLA models. Now it takes just 48 hours with PolyJet technology, meaning it is 10 times quicker for us to create surgical guides. This has been a game-changer for our customer service, enabling us to provide our patients with an accurate surgical guide faster than ever before.”



A 3D printed surgical guide mounted on a replica of a patient’s jaw.



A 3D CAD model of surgical guide used to position implants on the patient’s jaw bone.

A Positive Prognosis

Surgical Implant 3D was pleased enough with PolyJet technology to invest in its own Objet Eden260VS Dental Advantage™ 3D Printer. In-house 3D printing enabled the company to expand its business, including opening a 3D printing dental service focused on manufacturing guides for implantology for other dental surgeries.

“3D printing has given us the power to create an entirely new business model,” says Jager. “Since bringing PolyJet technology in-house, we have been able to reduce our costs significantly, and as a result, enable us to offer other dental surgeries a far more competitive price. We can now pass the savings onto our customers by charging €238 for six implants instead of €600-700 with the previous manufacturing process.”

Looking ahead, Surgical Implant 3D is optimistic about the potential of its 3D printing dental service.

“We are targeting between 200 and 400 new clients and see a business opportunity of €1 million – €1.2 million turnover, so investing in this technology has been the best move we have ever made,” concludes Jager.

	TIME TO FIRST PROTOTYPES	COST FOR SIX IMPLANTS
Outsourcing with SLA models	3 weeks	€600-700
In-house with PolyJet technology	48 hours	€238
Savings	19 days (90%)	€362 (60%)

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