

Background

Dental Implants and Astra Tech

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Tooth loss: A common problem

Tooth loss affects many people. Between 6% and 10% of the populations of North America, Japan and Europe have no teeth in either their upper or lower jaw.

More than 240 million people in these parts of the world are missing one or more teeth. Some five million (2%) have dental implants, while 50 million have traditional bridges or false teeth. The majority of more than 180 million people receive no treatment at all and they simply live with one or more gaps in their mouth.

Retirees are the largest, most rapidly growing age group in need of tooth restorations. According to the World Health Organization, 29% of the population in the U.S., 50% in Australia and 20% in Japan above the age of 65 have no natural teeth.

In Europe, the percentage of people over 65 years old who are missing all their teeth, varies considerably. Sweden (13%) and Switzerland (12%) are in relatively good shape, Germany (25%) does not fare quite as well, while the UK (57%) and the Netherlands (65%) fare much worse.

Traditional solutions

The average life expectancy is generally increasing and older people represent a growing percentage of the population. The demand for functional, attractive teeth at all stages of life has also grown in recent years. Many older people lead active lifestyles and are now unwilling to accept traditional solutions, such as bridges and dentures, that may adversely affect their overall appearance and leave them with less than ideal chewing function. Younger people who have lost one or more teeth are eager for solutions that feel like real teeth and that will last for the rest of their lives.

A traditional bridge requires the dentist to grind down adjacent teeth so that there is a support to which the bridge can be fastened. However, supporting teeth can decay and/or loosen over time requiring the need for new bridges.

When all the teeth in either the upper and lower jaw are gone, dentures represent one treatment option. But because traditional dentures do not help stimulate and maintain the jaw bone, the bone continues to resorb over time, leading to loose and ill-fitting dentures that often cause irritation to the gums and slurred speech. As a result, a common outcome is a deterioration in quality of life due to embarrassment and discomfort.

Dental implants

The field of dental implants is evolving rapidly. New technologies and improvements in biocompatible materials have enabled the development of systems that ensure faster healing, more reliable results and an esthetic outcome.

Dental implants first appeared back in the mid-1960s when Swedish professor Per-Ingvar Brånemark discovered that the body accepted titanium and could integrate it with existing bone tissue. This made it possible to place dental implants in the jawbone so that new teeth could be attached to them in a way that resembles nature. Implants can now be used to replace missing teeth in all situations from a single tooth to the entire set of teeth in both jaws. In other words, patients have access to dental solutions that look, feel and function like natural teeth. They can chew and smile as usual.

The first part of the treatment involves a surgical procedure during which the implant, a small titanium screw, is installed in the jawbone. The implant serves as a root and is integrated as new bone mass forms in contact with the surface of the titanium. A titanium or ceramic abutment is fastened to the implant. A crown, the visible part of the reconstructed tooth, is then placed on the abutment. When multiple teeth are to be replaced, two or more implants are installed to build the foundation for a fixed implant bridge reconstruction.

The current trend is moving toward shorter treatment periods and earlier loading of the implant. Depending on the patient's condition and choice of treatment, the process can range from immediate loading to a treatment period of several months. The patient receives temporary tooth replacement during the treatment period.

Market trends

Growing demand for attractive, functional tooth replacement has created a large potential market. With approximately 20% annual growth, dental implants are the most rapidly expanding segment of the global medical devices sector. Astra Tech is expanding at a rapid pace in the dental implant industry and has in the past few years grown at a rate of over 40%, double the market average.

The trend in the industry is also moving toward fewer and larger international firms. The first wave of consolidation took place some five years ago. Today, six or seven companies spearhead developments and about 100 smaller businesses operate within various niches of the market.

Astra Tech acquires leading company of CAD/CAM technology

As part of Astra Tech's growth strategy, the US company Atlantis Components, Inc. was acquired by Astra Tech in September, 2007. The acquisition of Atlantis gives Astra Tech access to advanced know-how and the latest CAD/CAM technology for individually fabricated abutments based on each patient's individual needs. An abutment acts as the link between the implant and the crown (the visible part of the replacement tooth).

When an abutment is produced using Atlantis' patented method, the appearance of the completed tooth is used as the basis for fabrication. The dentist takes an impression that is scanned into a software program where the new tooth is then designed.

Production of abutments is done in computerized milling machines controlled by CNC (Computer Numerical Control). This control system makes it possible to produce complicated, individually adapted components in an efficient manner. The abutments can be made of titanium or zirconium. Zirconium is a ceramic material that is used primarily for restoring front teeth where demands for esthetics are particularly high. Atlantis' abutments can be used together with most major implant systems available on the market. In the future, it will also be possible to use digital technology for producing crowns and bridges.

Atlantis method in combination with Astra Techs implant system ensures an optimal connection of the abutment to the soft tissue making it possible to achieve ideal esthetics and stability. The precision of the individually fabricated abutments helps eliminate the need for dentists to make additional modifications to the abutment, allowing for reduced chair time. The digital process also provides simplified procedures and increased profitability for the dental laboratories.

Atlantis Components, Inc. is based in Cambridge, Massachusetts, near Astra Tech's North American subsidiary headquartered in Waltham, Massachusetts. Both organizations will be combined, and Atlantis' operations will be integrated into Astra Tech's using the combined know-how. A Center of Excellence for esthetics will be established, based on the Atlantis technology.

Astra Tech will begin producing Atlantis' abutments for the European market at its headquarters in Mölndal, Sweden starting 2008.

The launch and sales in Europe will be handled by Astra Tech's existing sales organization.

Astra Tech Implant System

Astra Tech is a leader in the areas of dental implant R&D. The Astra Tech implant system is backed by over 20 years of scientific documentation making it the most well-documented system in the world.

The most recent innovation, the world's first, and currently only, fluoride-modified titanium implant surface, OsseoSpeed™, is now available in Europe and the United States. The fluoride-modified surface, with its unique nano-structure, promotes more rapid bone healing that leads to more reliable treatment results.

Astra Tech's R&D is based on a holistic view in which a system of products and methods interact. A number of international studies are currently being conducted on the Astra Tech implant system. The most recent findings show that OsseoSpeed™ has a high success rate even in difficult cases. This opens the door to implant treatment for patients who have porous or insufficient jawbone. The near term focus of clinical research is to evaluate studies that look at OsseoSpeed's effect on specific risk groups, such as patients suffering from osteoporosis.

Astra Tech's clinical studies are conducted in collaboration with universities all over the world. The studies are linked to independent advisory boards in order to ensure objectivity and the highest ethical standards. At present, some 250 dentists are involved in the clinical studies and evaluations, which include over 800 patients in the United States, Europe, and other parts of the world.

Focus on education

Education is an important part of Astra Tech's operations in their efforts to help dental professionals provide the best possible quality of treatment for their patients. Astra Tech has provided implant training for tens of thousands of dentists, and that number is steadily increasing. New programs are continually added to keep pace with developments in implant systems and treatment methods.

The most recent development within the area of education is the official opening on June 14, 2007 of the new, international training center at Astra Tech's headquarters in Mölndal, Sweden. The company has invested SEK 220 million in the new center for research and education and it is one of the most advanced facilities of its kind in the world. Dentists from many countries will be given the opportunity to come to the center to learn advanced implant techniques.

Astra Tech has on-going collaboration with a number of universities and university hospitals, such as Göteborg University, Uppsala (Sweden) University Hospital, the University of Iowa, and the University of North Carolina. The collaborative efforts with these universities encompass both R&D and training.

Astra Tech in brief

Astra Tech is a medical technology company that develops, manufactures and sells dental implants and other leading-edge healthcare products, chiefly in the fields of urology, odontology and surgery.

Astra Tech, a subsidiary of the pharmaceutical company AstraZeneca, has its headquarters in Mölndal, Sweden, where there are facilities for research and development, as well as production. The company has subsidiaries in 16 countries in Europe, North America and Asia/Pacific and is represented by local partners in other selected markets.

Astra Tech has approximately 1 900 employees, including 900 in Sweden and 1 000 in subsidiaries. Posted revenue was SEK 2.7 billion in 2006.

The most important dental markets are the United States and Germany, where Astra Tech also has its strongest growth. In the United States, Astra Tech's dental operations are located in Waltham, Massachusetts, and urology operations are centered Torrance, California. Astra Tech Inc. employs over 200 people in the United States.

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