MEDICAL POLICY – 7.01.153
Adipose-Derived Stem Cells in Autologous Fat Grafting to the Breast

Effective Date: April 1, 2018
Last Revised: March 20, 2018
Replaces: N/A

RELATED MEDICAL POLICIES: None

Introduction

As part of breast reconstruction, a person’s own fat can be taken from other parts of the body and placed in the breast(s). There are risks of this fat transfer, including death of the fat cells and the chance that some of the transferred fat will migrate away from the breast area. Stem cells concentrated from the fat tissue are known as adipose-derived stem cells or ADSCs. Using ADSCs is proposed as a way to try to increase the success of a fat transfer to the breast. Medical studies have not yet determined whether injecting ADSCs could play a role in creating new tumors. The studies that have been done involve only a few patients who have been followed for a short time. For these reasons, using ADSCs as part of grafting a person’s own fat to the breast is considered investigational (unproven).

Note: The Introduction section is for your general knowledge and is not to be taken as policy coverage criteria. The rest of the policy uses specific words and concepts familiar to medical professionals. It is intended for providers. A provider can be a person, such as a doctor, nurse, psychologist, or dentist. A provider also can be a place where medical care is given, like a hospital, clinic, or lab. This policy informs them about when a service may be covered.
Service | Investigational
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Adipose-derived stem cells | The use of adipose-derived stem cells in autologous fat grafting to the breast is considered investigational.

Note: Autologous fat grafting to the breast without the use of adipose-derived stem cells is not subject to medical review.

Coding

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td></td>
</tr>
<tr>
<td>11950</td>
<td>Subcutaneous injection of filling material (eg, collagen); 1 cc or less</td>
</tr>
<tr>
<td>11951</td>
<td>Subcutaneous injection of filling material (eg, collagen); 1.1 to 5.0 cc</td>
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<tr>
<td>11952</td>
<td>Subcutaneous injection of filling material (eg, collagen); 5.1 to 10.0 cc</td>
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<tr>
<td>11954</td>
<td>Subcutaneous injection of filling material (eg, collagen); over 10.0 cc</td>
</tr>
<tr>
<td>19366</td>
<td>Breast reconstruction with other technique</td>
</tr>
<tr>
<td>19380</td>
<td>Revision of reconstructed breast</td>
</tr>
<tr>
<td>19499</td>
<td>Unlisted procedure, breast</td>
</tr>
<tr>
<td>20926</td>
<td>Tissue grafts, other (eg, paratenon, fat, dermis)</td>
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</table>

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Related Information

N/A
Evidence Review

Description

Following a mastectomy, patients often experience pain and irradiated skin. As an adjunct to reconstructive breast surgery, surgeons will sometimes graft autologous fat to the breast. Adipose-derived stem cells (ADSCs) have been proposed as a supplement to the fat graft in an attempt to improve graft survival; however, whether ADSCs play a role in tumorigenesis is still relatively unknown.

Background

**Autologous Fat Grafting to the Breast**

Autologous fat grafting to the breast has been proposed for indications that include breast augmentation and following oncologic surgery. Grafting would be performed as an adjunct to reconstruction after mastectomy or lumpectomy, and it would be of benefit in the following areas: for contouring purposes, improving the shape and volume of the breast, and for alleviating post mastectomy pain syndrome (neuropathic pain) and pain in irradiated skin (thereby reducing complication and failure rates of implant reconstruction). Variability in long-term results and oncologic concerns have limited the application of autologous fat grafting in the breast.

**Adipose-Derived Stem Cells**

Stem cell biology, and the related field of regenerative medicine, involves multipotent stem cells that exist within a variety of tissues, including bone marrow and adipose tissue. A single gram of adipose tissue yields approximately $5 \times 10^3$ stem cells; this is 100 to 500 times greater than the number of mesenchymal stem cells found in an equivalent amount of bone marrow.$^1$ Stem cells, because of their pluripotentiality and unlimited capacity for self-renewal, offer promise for tissue engineering and advances in reconstructive procedures. In particular, adipose tissue represents an abundant and easily accessible source of adipose-derived stem cells (ADSCs), which can differentiate along multiple mesodermal lineages. ADSCs may allow for improved graft survival and generation of new fat tissue after transfer from another site.$^{1,2}$
The potentially therapeutic properties of ADSC have led to novel techniques of fat grafting in conjunction with ADSC for breast fat grafting. Differentiation of ADSC into adipocytes may provide a reservoir for adipose tissue turnover. Differentiation of ADSC into endothelial cells, with release of angiogenic growth factors by ADSC, may decrease the rate of graft resorption by increasing blood supply to the grafted fat tissue. Further, ADSC may serve to accelerate wound healing and protect the graft from ischemic reperfusion injury. Current methods for isolating ADSCs can involve various processes, which may include centrifugation and enzymatic techniques that rely on collagenase digestion—which, in turn, is followed by centrifugal separation to isolate the stem cells from primary adipocytes. Isolated ADSCs can be expanded in a monolayer on standard tissue culture plastic surfaces with a basal medium containing 10% fetal bovine serum. Newly developed culture conditions provide an environment in which the study of ADSCs can be done without the interference of animal serum and may also allow rapid expansion of autologous ADSCs in culture for use in human clinical trials. A standard expansion method has not yet been established.

To address the problems of unpredictability and low rates of fat graft survival, Yoshimura et al (2008) developed a technique known as cell-assisted lipotransfer (CAL), which produces autogenous fat rich in ADSCs. In CAL, half of the lipoaspirate is centrifuged to obtain a fraction of concentrated ADSCs; meanwhile, the other half is washed, enzymatically digested, filtered, and spun down to an ADSC-rich pellet. The latter is then mixed with the former, converting a relatively ADSC-poor aspirated fat to ADSC-rich fat.

A point-of-care system is available for concentrating ADSC from mature fat. The Celution System is designed to transfer a patient’s own adipose tissue from one part of the body to another in the same surgical procedure.

Summary of Evidence

For individuals who have breast cancer who receive autologous fat grafting to the breast with stem cell enrichment of the graft, the evidence includes small single-arm studies, some of which are prospective. Relevant outcomes are overall survival, disease-specific survival, symptoms, change in disease severity, morbid events, functional outcomes, quality of life, resource utilization, and treatment-related morbidity. Studies have mainly reported patient and investigator satisfaction and functional and cosmetic results. Limitations of the data include a limited number of patients, short-term follow-up, and lack of understanding of the possible oncologic influence ADSC may have on the fat grafting procedure. The evidence is insufficient to determine the effects of the technology on health outcomes.
Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in September 2015 did not identify any ongoing or unpublished trials that would likely influence this review.

Practice Guidelines and Position Statements

*American Society for Aesthetic Plastic Surgery and American Society of Plastic Surgeons*

The American Society for Aesthetic Plastic Surgery and the American Society of Plastic Surgeons released a joint position statement on the use of stem cells in aesthetic surgery in 2011. Based on a systematic review of the peer-reviewed literature, the societies concluded that while there is potential for the future use of stem cells in aesthetic surgical procedures, the scientific evidence and other data are very limited in terms of assessing the safety or efficacy of stem cell therapies in aesthetic medicine.

Medicare National Coverage

There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

Regulatory Status

In September 2006, Celution™ Cell Concentration System (Cytori Therapeutics; San Diego, CA) was cleared for marketing by the U.S. Food and Drug Administration’s Center for Devices and Radiological Health through the 510(k) process as a cell saver device. The system is cleared for the collection, concentration, washing, and reinfusion of a patient’s own cells for applications that may include, but are not limited to, cardiovascular, plastic and reconstructive, orthopedic, vascular, and urologic surgeries and procedures. Food and Drug Administration product code: CAC.
References


History

<table>
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<th>Date</th>
<th>Comments</th>
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<td>12/08/15</td>
<td>New Policy. Policy created with literature review through September 13, 2015; the use of adipose-derived stem cells (ADSC) in autologous fat grafting to the breast is considered investigational. (Note: The former policy addressing both autologous fat grafting and ADSC has been archived. This policy only addresses ADSC. Policy statement regarding ADSC remains investigational.)</td>
</tr>
<tr>
<td>06/01/16</td>
<td>Annual Review, approved May 10, 2016. Policy updated with literature search. Reference added. No change to the policy statement.</td>
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Email AppealsDepartmentInquiries@Premera.com

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U.S. Department of Health and Human Services
200 Independence Avenue SW, Room S09F, HHH Building
Washington, D.C. 20201, 1-800-368-1019, 800-537-7697 (TDD)

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