**Objective:** To determine the acceptability of porcine and bovine surgical implants among persons of Jewish, Muslim, and Hindu faiths whose beliefs prohibit them from consuming porcine and bovine products.

**Data Sources:** An evaluation of current literature concerning religious beliefs among persons of Jewish, Muslim, and Hindu faiths was undertaken to determine if animal-derived surgical implants are permitted for use in these religions.

**Study Selection:** Because of the limited published literature about this topic, the opinions of religious leaders in Australia were sought.

**Data Extraction:** Religious and cultural beliefs can conflict with and limit treatment options, especially in surgery. Approximately 81 porcine and bovine surgical implants are regularly used in Australia.

**Data Synthesis:** It is deemed acceptable for members of the Jewish faith to undergo surgery using porcine products. In dire situations and only after all other options have been exhausted, followers of the Muslim faith are permitted to use porcine surgical products. Hindu religious leaders did not accept the use of bovine surgical implants.

**Conclusions:** Australia comprises a multicultural society; therefore, it is necessary to consider religious beliefs of all patients. As part of a surgeon’s duty of care, the informed consent process should include a discussion about animal-derived surgical implants to avoid religious distress and possible litigation. A greater understanding of religious views would enhance the medical care of persons of Jewish, Muslim, and Hindu faiths.


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**PATIENT’S RELIGION AND HIS or her religious beliefs have the potential to influence medical decisions and can cause conflict regarding medical care. Certain religious groups have beliefs regarding the dietary use of porcine and bovine products that could limit treatment options during surgery, particularly as many surgical products contain prohibited materials. The Jewish Bible (the Tanakh), the Islamic Holy Books (the Suhuf-i-Ibrahim [commonly the Scrolls of Abraham], the Tawrat [Torah], the Zabur [commonly the Psalms], and the Injil [commonly the Gospel]) and the Koran prohibit persons of Jewish and Muslim faiths from ingesting porcine products because the pig is considered unclean. Followers of Hinduism avoid slaughtering cattle because of cultural and agricultural reasons, as cows are considered sacred, auspicious, and important laborers.**

Many medications and medical and surgical implants are made from porcine or bovine material; hence, their use among certain religious groups could be deemed insensitive. Unfortunately, the use of animal-derived medications or surgical implants may be unavoidable in some situations. Because of known dietary prohibitions among followers of Jewish, Muslim, and Hindu faiths, uncertainty develops among the medical profession when medications or surgical implants that contain porcine or bovine material are required. The use of animal-derived surgical material has the potential to cause ethical dilemmas that could potentially influence consenting practices and cause religious distress to patients, particularly if no alternative nonanimal product is available.

Little is known about what surgeons do when they are confronted with a religious conflict of this nature and how they navigate through it. Current literature has not addressed the use of porcine or bovine surgical implants. **See Invited Critique at end of article.**

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Vine surgical products among Jewish, Muslim, and Hindu religious groups. The use of religiously forbidden medications, particularly gelatin capsules and surfactants, has been described in the literature. Gelatin is widely used in medicine and is derived from collagen, which is a protein found in the skin and bones of cows and pigs. Religious debate has previously centered only on medications containing gelatin. Jewish, Muslim, and Hindu religious leaders suggest that alternative nonanimal products should be the first option. If no alternatives are available or if alternatives are inadequate, then an animal-derived medication is acceptable because it would be the only way to conserve life.

Xenotransplantation has also been widely examined in the literature relative to persons of Jewish and Muslim faiths. Investigations of religious laws and discussions with scholars disclose that xenotransplantation does not defy strict religious laws and is readily permitted in the Muslim and Jewish religions. It is expected that the prevalence of xenotransplantation will increase in the future, particularly as the pig is considered the most probable species for use in organ transplantation because its anatomy is similar to that of humans.

There is a lack of evidence available to surgeons about the use of animal-derived surgical implants among persons of different religions. The result is that when a surgeon is confronted with a patient who wishes to avoid animal-derived surgical material, he or she is unable to draw on established principles. This type of situation can prove difficult for the treating physician; therefore, guidelines are needed to help surgeons navigate religious conflicts. The deficit in knowledge led us to examine this topic to assist surgeons in determining the right course of action when confronted with a patient who refuses surgical implants based on his or her religious beliefs.

### Table. Some Porcine and Bovine Surgical Products Used in Australia

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer or Distributor</th>
<th>Constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgibone</td>
<td>Advanced Surgical Technologies, Melbourne, Australia</td>
<td>Extracellular composite of hydroxyapatite and collagen of bovine bone</td>
</tr>
<tr>
<td>Contigen cross-linked collagen</td>
<td>Bard Australia, Sydney</td>
<td>Bovine dermal collagen cross-linked with glutaraldehyde</td>
</tr>
<tr>
<td>Temporary intracanalicular collagen implant</td>
<td>Designs for Vision, Sydney</td>
<td>Collagen plugs of animal origin</td>
</tr>
<tr>
<td>Pyrost bar, block, rectangular wedge, cylinder, cylindrical wedge, plug</td>
<td>Stryker Australia, Sydney</td>
<td>Bone matrix implants, bovine bone</td>
</tr>
<tr>
<td>Pericardial patch</td>
<td>Edwards Lifesciences, Irving, California</td>
<td>Glutaraldehyde-treated bovine pericardium</td>
</tr>
<tr>
<td>Bio-Oss natural bone mineral</td>
<td>Henry Schein Halas, Norwood, Australia</td>
<td>Mineral portion of bovine bone</td>
</tr>
<tr>
<td>Integra artificial skin</td>
<td>Integra Neurosciences, Carnegie, Australia</td>
<td>Porous matrix of fibers of cross-linked bovine tendon collagen and glycosaminoglycan (chondroitin-6-sulfate)</td>
</tr>
<tr>
<td>CollaCote, CollaTape, BioMend</td>
<td>Monarch Medica Australia, Stafford, and Zimmer Dental Australia, Frenchs Forest</td>
<td>Collagen obtained from bovine deep flexor (Achilles) tendon</td>
</tr>
<tr>
<td>Avitene</td>
<td>Bard Australia</td>
<td>Purified bovine corium collagen</td>
</tr>
<tr>
<td>Spongostan</td>
<td>Johnson &amp; Johnson, Ultimo, Australia</td>
<td>Porcine gelatin sponge</td>
</tr>
<tr>
<td>Angio-Seal hemostatic puncture closure device, STS Platform</td>
<td>St Jude Medical Australia, Lane Cove</td>
<td>Animal-origin absorbable collagen sponge</td>
</tr>
<tr>
<td>BioNova vascular graft</td>
<td>Bio Nova International Pty Ltd, Melbourne</td>
<td>Animal collagen vascular prostheses</td>
</tr>
<tr>
<td>Carpentier-Edwards Perimount pericardial bioprosthesis</td>
<td>Edwards Lifesciences</td>
<td>Prosthetic heart valves constructed from 3 pieces of bovine pericardial tissue</td>
</tr>
<tr>
<td>Plain gut sutures, chromic gut sutures</td>
<td>Dynek P/L, Hendon, Australia</td>
<td>Collagen</td>
</tr>
<tr>
<td>Plain gut sutures, chromic gut sutures</td>
<td>Johnson &amp; Johnson</td>
<td>Submucosa of sheep intestine, serosa of beef intestine</td>
</tr>
<tr>
<td>Davis &amp; Geck range (chromic Softgut, chromic gut, plain gut), Surgigut range absorbable surgical gut sutures (plain, chromic)</td>
<td>Autosuture (a division of Tyco Healthcare), Lane Cove</td>
<td>Collagen</td>
</tr>
<tr>
<td>Peri-Strips Dry</td>
<td>Advanced Biomedical, Ringwood East, Australia</td>
<td>Bovine pericardium cross-linked with glutaraldehyde</td>
</tr>
</tbody>
</table>

### Perspectives Regarding Porcine Surgical Material

#### Judaism

It is well known that consumption of pork is prohibited by persons who practice the Jewish faith and that this substance is strictly avoided. As part of the teachings of the Jewish Bible (Tanakh), members of the Jewish faith are forbidden to eat pork or to raise pigs. The Leviticus
in the Tanakh states that swine “... is unclean to you. ... their flesh shall ye not eat, and their carcass shall ye not touch; they are unclean to you.”

In Judaism, it is important to preserve life, to treat illness, to relieve suffering, and to ensure that everything possible is done for the patient. Preservation of human life is considered a divine commandment, and it is imperative to save a life. Therefore, all medical decisions must be in the patient’s best interest, and the safest and gentlest treatment must always be the preferred option.

If a porcine product is used to save a Jewish life, all religious laws are automatically suspended because Jewish law permits the violation of certain rules to achieve the higher good of protecting life.

However, some scholars interpret that Jewish law forbids any oral use of medication containing porcine material, and there is a popular belief that transplanting porcine products into a patient who practices the Jewish faith is prohibited. These conflicting opinions regarding the use of porcine products in Judaism can be confusing for the treating surgeon. Rabbi Faitel Levin (written communication, July 4, 2006) and Professor Bernie Tuch, FRACP, PhD (written communication, July 23, 2006) state that followers of Judaism are not forbidden to derive benefit from porcine products, although they are prohibited from consuming pork. No prohibition states that pigs should not be used to cure illness or to save a human life. Therefore, it is legitimate to use porcine products among persons of the Jewish faith until science finds a suitable substitute.

Persons in different countries, generations, or family configurations vary in how they approach Jewish law and medical issues. Some followers of Judaism associate a taboo with all aspects of pig use and fear the use of porcine products, despite the fact the absence of religious law forbidding its use in medicine. In situations in which porcine products are to be used, the position of religious leaders may need to be considered. Jewish law is binding, and most Jewish patients will want to know or follow their rabbi’s interpretation of it; therefore, it is imperative that surgeons liaise with a patient’s rabbi before any surgery that uses porcine products.

ISLAM

In Islam, the prohibition to consume porcine products is steeped in religious teachings, much as in Judaism. The Koran states that “you are forbidden [the consumption] of carrion, blood, swine flesh. ... for these are unclean.”

Life is sacred and has great value in Islam; therefore, it is considered a duty to save life. Islam teaches that the saving of life is important and should be held above all other religious beliefs. Allah Almighty states that “... necessities overrule prohibitions,” and although pork is specifically prohibited in the diet, it is acceptable in certain situations for which no lawful alternative is found. The Islamic Institute of Australia resonated these findings in stating that followers of the Muslim faith in Australia can gain benefit from porcine material only in extreme circumstances in which life and death are involved and in which no other alternative is available (Sister Amina Wahid, written communication, July 17, 2006). Much as in the Jewish faith, there are some scholars who disagree with the use of porcine products. Muslim leaders in a study by Enoch et al agreed with the use of biologic products except for those of porcine origin. These leaders believe that the use of a nonanimal alternative to a porcine-derived product is the preferred option, despite whether it takes longer to heal or is more expensive.

Muslim patients should be involved in decision making relating to their medical care. They may wish to consult with their cleric to fully ensure that the animal-derived surgical product is acceptable in their teachings.

HINDUISM

In Hinduism, the cow is a sacred animal; therefore, it is considered a sin to kill it. Unlike the pig, which is considered unclean to persons of the Jewish and Muslim faiths, contact with products of the cow is considered purifying in the Hindu religion. Followers of Hinduism are able to use all by-products of cows such as milk, curds, ghee, urine, and dung in everyday life. Since 200 AD, Hindu populations have been forbidden to slaughter or abuse cows, with laws passed prohibiting abuse. Before 200 AD, cattle slaughter was part of ceremonial gatherings, but beliefs regarding cattle have changed in India because of population growth and the need for agricultural subsistence.

There is no written evidence about the stance of Hinduism on the use of bovine material in surgery. Therefore, medications of bovine origin will be discussed to better understand the view. Hindu patients take offense at medication containing bovine material, and issues arise when products such as gelatin (widely used in anesthesia, drug capsules, and intravenous fluids for resuscitation) are given. The literature contains a case study that details a Hindu family’s decision to avoid a surfactant called beractant (Suvanta) because it contained bovine material. This decision was based on the family’s spiritual beliefs about cattle. This same sentiment regarding the use of bovine material was resonated by the Hindu Council of Australia. According to the chairman of this council, the Hindu community will not undergo surgery with surgical implants derived from bovine materials because this would necessitate the killing of cows to produce the surgical product (Dr Appupillay Balasubramaniam, MBBS, FRACP, written communication, June 30, 2006).

We were intrigued by the stance of the Hindu Council of Australia, particularly as we were unable to verify their opinion in the published literature. We thought that the Hindu Council of Australia was upholding the global view of the sacredness of cattle because they could not defy their cultural beliefs. Hence, there may be varying degrees of observance, belief, and practice among Hindu populations. Therefore, physicians need to be sensitive to this diversity and to avoid stereotyping of Hindu patients.

HOW DO RELIGIOUS SENSITIVITIES AFFECT SURGEONS?

Patients with religious ideals may disagree with their surgeon about what is the best course of treatment for their...
medical care. When treating a patient, it is essential that surgeons have a basic level of awareness about different religious sensitivities.

Many physicians are unaware of what constitutes some of the medical and surgical products they use. Adappa et al. found that 9 of 42 interviewed physicians who were second on call routinely discussed with patients what ingredients are included in medications. It was found that many physicians do not incorporate religious sensitivities into their practice or do not know enough about religious prohibitions and products they prescribe. It is not a common practice to obtain consent from patients who belong to various religions or cultural backgrounds who are to become recipients of biologic products.

Medicine involves respecting patient autonomy and providing patients with the opportunity to make informed and voluntary decisions about their health care. It is the duty of the surgeon to explain the nature, purpose, and risk of a treatment during the informed consent process. When animal-derived surgical implants are to be used, patients’ religious, cultural, and ethical beliefs need to be considered and respected. The failure to inform patients of what constitutes a product is a violation of Article 9 of the Human Rights Act, which states that “everyone has the right to manifest his religion or belief, in worship, teaching, practice and observance.”

Religious patients may experience distress and be unacceptable of an animal-derived surgical product because it may breach their personal views of how they view their religion. For example, patients who are Jehovah’s Witnesses are forbidden blood transfusions because blood represents the “life of the being” and is sacred. Therefore, they believe that the use of blood in transfusions would be a violation of the law of the sacredness of blood. Followers of this faith who are forced to undergo blood transfusions may consider it to be “a form of battery and suffer related emotional stress” that may result in their “being spiritually cut off from a broad community of friends and family.” Therefore, surgeons must remember that patients have the final say as to what procedures may or may not be performed on their bodies based on interpretations of their religion.

Surgeons must not make assumptions about patients’ religious viewpoints because many have differing convictions and commitments to their faiths. There is a need for surgeons to be aware of these religious issues, particularly because we live in a multicultural society in which religion is constantly shaping the modern world. If surgeons ignore religious ideals and neglect to explain the constituents in biologic products, there may be serious consequences, including patient distress and litigation.

THE FUTURE

There remain several issues regarding the care of religious patients in which surgeons are put in vulnerable situations when a patient’s religion interferes with appropriate treatment. Sensible guidelines need to be developed to help surgeons navigate these conflicts. The introduction of guidelines similar to those that have been developed for patients who are Jehovah’s Witnesses about blood products could be designed to incorporate the religious ideals of persons of Jewish, Muslim, and Hindu faiths.

To help surgeons become more aware of which marketed products contain biologic material, future developments such as the design and introduction of a database of medicines and surgical materials should be promoted. This database could indicate which preparations contain animal material and, if available, offer suitable nonanimal alternatives. This type of record and surgeons’ awareness of differences in religious beliefs could facilitate better patient care.

Many religions offer a degree of relaxation of their respective laws in extreme circumstances. Further deliberation between religious leaders and surgeons needs to occur. Religious leaders and surgeons should collaborate to find acceptable compromises in cases in which suitable treatments or treatment regimens do not exist. In addition, religious leaders may need to be educated about medical issues to help raise awareness about the use of animal products in surgery. Previous experience with religious leaders has shown that they are generally supportive of treatment using components of forbidden animals as long as there are no alternatives and the lack of treatment would otherwise cause death.

SUMMARY

It is a surgeon’s instinct to preserve and save life. A patient’s religious ideal may conflict with a surgeon’s view of appropriate treatment, particularly if the treatment is produced from a biologic product that is prohibited or is sacred. Surgeons need to have the knowledge to be sensitive to a patient’s individual religious beliefs, values, and cultural background. As part of respecting a patient’s autonomy, surgeons need to understand worldwide religious views and to be sensitive to other religious beliefs. The understanding of religion and what is acceptable within each can help to shape surgeons’ ideals and to enhance their duty of care and practice of medicine and surgery.

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This is a thought-provoking and interesting study that touches a relevant area affecting all medical and surgical practitioners. Much like the proscription by Jehovah’s Witnesses about blood transfusions, the question is asked, “Do these 3 faiths have the same concerns about the medical use of animal products given their doctrines that prohibit the dietary use of these same products?” The authors correctly admonish sensitivity to other faiths, particularly to patients’ religious views regarding the use of animal products in their medical care. While one might be critical of the authors for the small sampling of religious authorities contacted regarding the doctrinal views of the respective faiths, the article still has relevance for our time. Also complicating the issue is the fact that there is no central authority among the 3 faiths studied in this circumstance. It is possible that there may be regional or local variation in interpretation of the dietary laws. A larger sampling of religious authorities might have instilled more confidence in the results of the study. Nevertheless, this study is timely and relevant with the virtual explosion of animal products in current use in the United States. They include porcine valves, cadaver tendons, human cadaveric dermis, porcine dermis, corneal transplants, and others. It may be tempting for the scientist and practitioner to question proscription of porcine products now that the dietary risks associated with well-cooked pork are no greater than those associated with other animal meats used for consumption or to question prohibition of bovine products, particularly when they are sterilized and decellularized. However, such scientific musings will not overcome millennia of religious practices that are a part of the theology of the groups that are studied in this report. As the authors point out, with the Internet, satellite broadcast, transportation, and increasing diversity in our society, it is more important than ever to be sensitive to other cultures and other traditions. It is critical that surgeons communicate openly and frankly with their patients if they plan to use animal products that might violate religious laws. This work is relevant and makes the reader think about the responsibility we all have to be honest with our patients as we try to render the highest quality medical care possible.

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