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Pig Kidney Xenotransplantation as an Alternative Solution of *Hifdz Al Nafs*

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Abstract

Recently, US surgeons successfully tested pig kidney transplants in a human patient, which caught the medical community by surprise. This has elicited a range of responses, including among Muslim communities, whether it is permitted by shariah or vice versa. Some Muslim scholars stated that pigs are prohibited animals under Islamic law. In contrast, others saw this success as the most recent alternative treatment for kidney failure in recent history. This research examines the issue of transplanting pig kidneys into human bodies by *maqasid al-syari'ah* (*hifdz al-nafs*). The full qualitative method was employed, which was based on library research to investigate the stated problems, and all the findings were analyzed descriptively. The study shows, first and foremost, a pig is one kind of animal that is prohibited under Islamic law in any form. Two conditions must be fulfilled before the transplant of a pig's kidney into a human body can be justified: (1) it must be performed in an emergency where there is no alternative medicine or other sacred organs available; and (2) the harm resulting from the transplant itself must be less than the harm resulting from not performing the transplant. Thus, the transplantation of a pig's kidney into a human body is part of the *hifdz al nafs* effort to implement *maqasid al dharuriyyat* for the patient's survival.

Keywords: Pig Xenotransplantation, *Hifdz al Nafs*

INTRODUCTION

Health is very pivotal in life. Organ transplantation is one of the methods used in modern medicine to improve patients' health (Sari, 2020). Muslims' socio-religious lives are being challenged by advancing knowledge and technology. One of these advancements in the medical field's progress in organ transplantation from animals to humans. Islamic texts can have serious religious implications once animals used in transplantation are deemed unlawful (*haram*) by Islamic texts (Nurmansyah, 2020). Moreover, the recent breakthrough of transplanting pig kidneys into human bodies carries *maslahah* for human life, primarily for patients with severe body problems.

Donor organs can be harvested from non-human primates like gorillas because they are closer to humans. This is one reason why most advanced xenotransplant tests continue to be performed on monkeys. The problem is that baboons, gorillas, and chimpanzees are all listed as endangered species. Additionally, there are concerns that certain zoonotic viruses, similar to the coronavirus, can spread from monkeys to humans (Hasan, 2021).

As a result, pigs have become the preferred animal for researchers for a range of reasons: Pigs are considered to be an ideal and low-risk animal for transplantation because (1) they grow up quickly, (2) they reproduce in large numbers, and the size of their organs is comparable to that of humans, and (3) their organs are similar in size to that of humans (Iwase & Kobayashi, 2015).

The first successful transplantation of a genetically modified pig heart into a terminally ill human patient has sparked widespread controversy among Muslims around the world. For instance, one of the Muslim scientists, Aasim Padela, stated, "There is no doubt that the Quran, for example in surah al-Maidah

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verse 3, declares pigs to be *rijss*, which means filthy and the debate occurs on the question of when it's okay to use it, but the base condition is that it's haram" (Hasan, 2021), whereas others saw differently.

"You have prohibited carrion, blood, the flesh of swine, and what has been offered to other than Allah (Al-Mā'idah: 3)"

"He has forbidden you only the maytatah (dead animals), and blood, and the flesh of swine, and that which is slaughtered as a sacrifice for others than Allah (or has been slaughtered for idols, etc., on which Allah's Name has not been mentioned while slaughtering). But if one is forced by necessity without wilful disobedience nor transgressing due limits, then there is no sin on him. Truly, Allah is Oft-Forgiving, Most Merciful (Al-Baqarah: 173)"

In short, pigs are one of the animals that Islam forbids for their use in any form. But on the other hand, pigs are also one of the animals most often used in medical science to produce the latest discoveries, especially in the health sector. This contradiction makes this issue interesting to discuss further by looking at the Islamic sharia principles. In general, this research is not a new study. There have been many previous studies that have made transplantation an object of research material. But specifically, this research takes a theme that has not been discussed before by many researchers, namely the focus on responding to xenotransplantation of pig kidneys by looking at the implementation of one of the elements of maqashid shariah, namely hifdz nafs.

Previous researchers mostly researched transplants in general from the aspect of Islamic law as well, such as Sri Ratna Suminar in her article "Aspek Hukum dan Fiqih tentang Transaksi Organ Tubuh Untuk Transplantasi Organ Tubuh Manusia", concluding that scholars have agreed to include human organs. as goods (property) that cannot be traded. (Sri Ratna Suminar, 2010) Further research was conducted by Saifullah under the title " Transplantasi Organ Tubuh (Perspektif Hukum Islam, Hukum Positif dan Etika Kedokteran)".(Saifullah., 2016) This study concludes that the law of transplantation is allowed if it is intended for the treatment, on the condition that the party who performs it must be a medical professional. Another study was conducted by Lia Laquna Jamali under the title "Transplantasi Organ Tubuh Manusia Perspektif al-Qur'an".(Lia Laquna Jamali, 2019) This study also concludes that the different views expressed by the scholars are related to the law of human organ transplantation.

RESEARCH METHOD

In this study, a fully qualitative and exploratory method was used. This research is mainly concerned with critically examining materials derived from primary and secondary sources, including textbooks, journal articles, seminar papers, and newspapers. Data from supporting documents relevant to the research topic were then analyzed descriptively, and expert opinions from various literature.

RESULTS AND DISCUSSION

Origins of Xenotransplantation

Xenotransplantation is one type of transplantation. In the Oxford Advanced Learner's Dictionary, it is stated that the word transplant is defined as taking organs, skin, and so on from a person, animal, body part, and so on and then putting it into another person's body (Hornby, 2000). In medical science, transplantation is defined as removing organs that are not functioning properly to increase health expectations (R. Sjamshudajat, 2005). At first, transplantation only applies to two types of the same

organism, animals with animals or humans with humans (Lopp, 2013). However, advances in knowledge have opened up wide opportunities for organ donors across organisms, such as animals to humans. (A. J. T. Cooper, David K. C., Burcin Ekser 2015) The opportunity to transplant animal organs into humans using xenotransplantation by modifying animal genes to resemble human genes (David K.C. Cooper and Robert P. Lanza, 2000).

Technically, transplantation requires at least three main elements as its constituent materials (Abuddin, 2014). *First*, the donor is an organism that gives its body parts to be given to an organism that has organ dysfunction (A. J. T. Cooper, David K. C. 2015). *Second*, the recipient is an organism that suffers from organ dysfunction, thus requiring the replacement of a new, healthier organ. *Third*, a team of experts, namely people who have special expertise in medicine, whose job is to replace a dysfunctional body person with a good body person through medical mechanisms (Abuddin, 2014).

The transplant is divided into two parts in terms of the transplant used: *First*, tissue transplantation, such as corneal grafting of the eye. *Second*, organ transplantation, such as kidney transplantation, heart, and so on (Fuqaha, 2004). Meanwhile, in terms of the genetic relationship between the donor and recipient, transplantation can be divided into three types (Zeyland, J., D. Lipiński, 2015) as below:

1. Autotransplantation is a transplant that is carried out by one organism by utilizing another body part as a donor. If a person has a wound on the face, then to cover the wound, a transplant is carried out using meat from other body parts.
2. Homo Transplantation is organ transplantation carried out by two types of the same organism, for example, human organs using other human organs.
3. Hetero Transplantation/xenotransplantation/xenograft is a transplant that is carried out using different parts of the organism's organs, for example, the transplantation of animal organs into human organs (Kutbuddin Aibak, 2009).

In more detail, xenotransplantation can be concluded as any procedure that involves transplanting, implanting, or infusion into a recipient human body, either living cells, tissues, or organs of a different species. Whether the body fluids, cells, tissues, or organs of another person. However, with organisms of the same species, Fetal neurons (stem cells), porcine pancreatic cells, encapsulated bovine chromaffin kidney cells, primate bone marrow, and extracorporeal devices that use all organs or cells also fall into this category. (Gulyaev et al., 2019).

Human xenografts include bovine Pericardium used in heart valves, viscera used in gut sutures, the bone used in dental implants, collagen used in lacrimal plugs, and human cells grown in fetal calf serum-containing media, and tissue culture cells exposed to bovine trypsin (R. Sjamsuhidajat, 2005). Porcine – Heart valves, corneal shields made of collagen, blood vessels in vascular grafts, wound dressings made of collagen, Pericardium, viscera, bone, hyaluronic acid, and collagen are all components of the device. Tissue culture media and enzymes are examples of manufacturing reagents. These tissues must be sterilized properly (Ahmed & Dubey, 2019).

The history of the clinical application of inter-species transplantation was first recorded in the early 20th century, when kidney transplants from rabbits, goats, sheep, primates, and pigs failed (Yamada, 2022). Since that failure, scientists have often conducted trials until 1963. Reemtsma and his colleagues succeeded in transplanting chimpanzee kidneys into several human recipients. The patient who could survive the longest was nine months (Veatch, 2015).

Then the first heart xenotransplantation was carried out by Hardy and colleagues from the University of Mississippi in 1964 by transplanting chimpanzee hearts into humans. Since then, eight

xenotransplantations have been carried out, five using primate donor hearts, three chimpanzees, and two baboons (Lintang, 2013).

In 1992, in the latest pig organ transplant trial development, Zaplicki and colleagues transplanted a pig heart into a patient with Marfan's syndrome. The team identified no hyperacute rejection response during a survival period of only 24 hours (Lintang, 2013). The protocol also involves a porcine heart perfusion technique with the recipient's blood to remove anti-porcine antibodies before orthotopic pig heart transplantation (Pierson, 2020). And this pig heart valve transplant was successful, namely, pig heart valve transplantation to members of the American senate (Muladno and Zainal Abidin, 2004).

To increase the success of xenotransplantation from pig organs into the human body, currently, many developments of transgenic pigs are being carried out, namely through engineering technology in the hope that the human immune system can recognize pig organs, thus the rejection reaction of the human body to the entry of the transgenic pig organs (Gulyaev et al., 2019).

Brief of Islamic View on Pig

Normatively and under normal circumstances, pork is forbidden to be eaten or consumed by humans. However, the prohibition of pigs does not mean that humans have the right to destroy the pigs in the world. If this is done, there will be a systematic break in the chain of the whole reality of the universe, especially the chain of flora, fauna, and humans themselves. (Ingrid Ingka Prameswari, 2015) All normative legal provisions in Islamic teachings can be said to only apply in normal situations as reflected in the emergency law doctrine for the validity of a legal provision (A. M. N. S. Khan and Z. Abidin, 2004).

The Qur'an explains the prohibition of pork in four verses, namely surah al-Baqarah (2): 173, surah al-Ma'idah (5): 3, surah al-An'am (6): 145, and surah al-Nahl (16): 115. Allah says in al-Baqarah (2): 173:

إِنَّمَا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْخَنزِيرِ وَمَا أُهِلَّ بِهِ لِغَيْرِ اللَّهِ فَمَنْ اضْطُرَّ غَيْرَ بَاغٍ
وَلَا عَادٍ فَلَا إِثْمَ عَلَيْهِ إِنَّ اللَّهَ غَفُورٌ رَحِيمٌ

"Indeed, Allah only forbids you carrion, blood, pork, and animals that (when slaughtered) are called (names) other than Allah. But whoever is forced (to eat) while he does not want it and does not (also) exceed the limit."

According to Fakhr al-Dīn al-Rāzi, the mention of meat in verse is the part of the body that humans most widely used in the flesh, so the editor of the verse has implications for the prohibition of using the whole body of a pig. (Fakhr al-Dīn al-Rāzi, 1981) Meanwhile, Muḥammad Abduh forbade eating pork because pork is considered disgusting (Muḥammad, 1990). Furthermore, the prohibition of pork is clearly stated in Surah al-Maidah (5): 3:

حُرِّمَتْ عَلَيْكُمُ الْمَيْتَةُ وَالدَّمُ وَلَحْمُ الْخَنزِيرِ

"Forbidden to you (eat) carrion, blood, pork."

The term لَحْمُ الْخَنزِيرِ (pork) inverse is juxtaposed with the مَيْتَةُ (carcass), الدَّمُ (blood). لَحْمُ الْخَنزِيرِ is an arrangement consisting of the words لَحْمٌ and الْخَنزِيرِ (al-Husain bin Muḥammad al-Raghib Al-Ashfahāni, 1412). While الْخَنزِيرِ means pig, this understanding examines the true meaning that commentators widely use. However, some people interpret this word in a majaz way.

In the meaning of majazī, الخنزير refers to a person's attitude that resembles the nature (habits) of a pig. Linguistically, الخنزير is composed of three letters, *kha'*, *nun*, *za'* and *ra'*. This word is taken from the word خَزَزَ which means slanted, because of the slanted shape of the pig's eyes (Ali, 2000).

In the original macro context, Jalāl al-Dīn al-Suyūṭī, argues that this verse came down as a response to the behavior of friends who wanted to cook carrion meat (Al-Suyūṭī, 2002). The narration does not clearly explain the context related to the prohibition of carrion, only that the prohibition is related to other verses. The prohibition of blood and pork always follows the mention of the prohibition of carrion. There are indications that the prohibition desired in verse is related to consumptive things. As for taking benefits outside of consumption, some scholars believe that it is permissible (Nurmansyah, 2020).

Meanwhile, pigs are referred to as pork because, in pigs, the most used is meat. But the prohibition is not on the meat but on the whole only from pork, including the skin, praise, bones, fat, and other body parts (M. Ali, 2016). Consumption of pork in any form, be it pork chops, bacon, or ham, has harmful effects. Pigs are the host of many kinds of parasites and diseases that are harmful to humans. (Saifullah., 2016) Pigs only excrete 2% of their total uric acid content, and 98% are still stored in the body (Zulaekah, 2005). On the other hand, pigs have been studied as disease-carrying animals or hosts for parasites and contain many kinds of parasites and can cause intestinal worms (MM. Hussaini, 1983).

Hifdz al Nafs Through Pig Kidney Transplantation

Basically, pigs are prohibited in all forms, as confirmed in several suras in the Qur'an, including surah al-Baqarah verse 173, surah al-Ma'idah verse 3, and surah al-An'am verse 145. Pork is prohibited for at least four medical reasons, as follows:

1. Pork contains a variety of worms, some of which are extremely harmful to the body, such as tapeworms (taenia) and trichinae (worms of the intestine) (hairworms; roundworms that roll into the muscles, causing trichinosis).
2. Pork is more likely to transmit bacteria that cause disease than other meats.
3. Pork oil is difficult to digest and increases the risk of developing digestive, gastrointestinal, or nervous system diseases.
4. Contributes to the spread of virulent Influenza (Abidin, 2020).

To relieve the suffering of humans who are biologically abnormal or who suffer from a disease that causes damage to the function of an organ or cell, patients could use treatment alternatives like xenotransplantation, which involves the use of donor organs from animals with the aim of curing of a disease, such as heart damage-kidneys, and so forth (Nurmansyah, 2020).

Since the transplantation of pigs into human bodies is one of the contemporary problems of fiqh, Muslim scholars have expressed a variety of opinions on the subject. Those who disagree argue that the human body is sacred and should be left naturally intact as far as possible without any intervention. According to Al-Sha'rāwī, we do not own our bodies. It is a trust endowed to us by God (Mansur Ali, 2019), resulting it is not permitted to include anything unlawful (*haram*) inside the human body as the *hujjah* below;

Al-Qur'an,

يا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا وَلَا تَتَّبِعُوا خُطُوَاتِ الشَّيْطَانِ ۚ إِنَّهُ لَكُمْ عَدُوٌّ مُبِينٌ

"O mankind! Eat of what is lawful and pure in the earth, and do not follow in Satan's steps. Indeed he is your manifest enemy." (Al-Baqarah: 168)

Hadith,

13
 إِنَّ اللَّهَ أَنْزَلَ الدَّاءَ وَالذَّوَاءَ وَجَعَلَ لِكُلِّ دَاءٍ دَوَاءً فَتَدَاوُوا وَلَا تَدَاوُوا بِحَرَامٍ

"Allah has sent down both the disease and the cure, and He has appointed a cure for every disease, so treat yourselves medically, but use nothing unlawful." (Sunan Abi Daud)

20
 إِنَّ اللَّهَ لَمْ يَجْعَلْ شِفَاءَكُمْ فِي مَا حَرَّمَ عَلَيْكُمْ.

"Allah did not make your cure in what He made Haram (unlawful) to you." (Al-Bukhari)

On the other hand, those who permit the transplantation of pig organs into humans adhere to Islamic legal philosophy (*maqāṣid al-sharī'a*) and legal maxims (*al-qawā'id fiqhiyya*). The highest religious authority in Egypt, Dar Al-ifta Al-Missriyah, issued a fatwa stating that a pig's heart valve can be transplanted into a human if it has been chemically processed and has undergone sufficient transformation to the point where the valve's basic properties have been altered (Mansour, 2021).

Elaborating on its reasoning, the decree cites the process of turning wine, which is prohibited in Islam, into vinegar, which is permissible. However, if a patient's life is dependent on a pig heart valve and no other option is available, he or she need not be concerned about the valve's purity, as Allah the Almighty knows best (Al-Kady, 2021).

Besides, in Islamic law, there are some concepts in terms of *iztirar* (exigency) as stated by Mufti Aijaz. First, according to its need, a forbidden thing becomes permitted (jaiz) in the state of *iztirar* (Al-Shinawi, 2022). In the state of *iztirar*, haram things become permissible, be it alcohol or pork. (Rohmah, 2018) In fact, scholars have even said it is wajib or obligatory in some situations. Second, a concept called *tadaweh fil muharram* or medication with the help of something which is not permissible (Sarfraz, 2022).

Although pork is prohibited from being consumed because it is *dar'ious* to health, if it is re-examined, after the explanation about the prohibition of consuming pork in surah al-Baqarah verse 173 and surah al-Ma'idah verse 119, then in the last surah in surah Al-Anam It is mentioned about the permissibility of consuming pork if you have to.

إِلَّا مَا اضْطُرِرْتُمْ إِلَيْهِ

"except what you have to eat."

In this verse, it can be seen that when Allah mentions the forbidden foods in His noble book, namely the verses that have been mentioned, He prescribes in emergencies things that are following it. So in an emergency, He allows some of what is forbidden under normal circumstances, according to what is needed to eliminate the harm (Shalih, 2011), as been said in Islamic ruling that something forbidden can become permissible if there's a medical necessity.

9
 فَمَنْ اضْطُرَّ غَيْرَ بَاغٍ وَلَا عَادٍ فَلَا إِثْمَ عَلَيْهِ إِنَّ اللَّهَ غَفُورٌ رَحِيمٌ

"But should someone be compelled, without being rebellious or aggressive, there shall be no sin upon him. Indeed Allah is all-forgiving, all-merciful." (Al-Baqarah:173)

18
 فَإِنْ تَرَاحَمَ عَدَدُ الْمَصَالِحِ يُقَدَّمُ الْأَعْلَى مِنَ الْمَصَالِحِ

"if two benefits clash, then the predominant one takes precedence."

الضَّرُورَاتُ تُبِيحُ الْمَحْظُورَاتِ

"necessity makes forbidden things permissible."

Furthermore, Qabbānī divided rights into four categories, which are as follows: (1) rights that are solely God's; (2) rights that are solely people's; (3) rights that God and people share, but people's right is dominant over God's right; and (4) rights that are shared by both, but God's right is dominant. According to him, the human body is the site of one of God and people's rights, but people's rights take precedence over God's. God's right over humans is the right to be worshipped (*ḥaqq al-isti'bād*), whereas people's right over their bodies is the right to benefit from their continued existence (*ḥaqq al-istimtā' bi-baqā'ihā*). Humans should therefore protect their *nafs* by continuing to live even if they must perform xenotransplantation under certain conditions (*darūra*) (Mansur Ali, 2019).

Regardless of those differences, Muslim scholars agree that Allah SWT honors every human being who protects his life and the safety of his soul a sense life is precious. Islam also is extremely concerned with the protection of human life (*hifdz al nafs*) (Mohammed Abdel & Tarshany, 2016), where saving or assisting in the saving of human life is an obligation (*wajib*). He said:

وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا

"and whoever saves a life is as though he had saved all mankind." (Al-Mā'idah: 32)

Thus, the *maqāṣid al-sharī'a* has arranged for the preservation of *nafs* (hifdz al nafs), because *nafs* is one of the most incalculably vital things for human.

CONCLUSION

The pig is one of the animals that Islam forbids for its use in any form. Still, the pig is also one of the animals most often used in medical science to produce the latest discoveries like xenotransplantation involving pigs despite different opinions among Muslims. It occurs due to there being no explicit texts either in the Qur'an or the Hadith that directly address it. However, contemporary Muslim scholars tend to allow pig kidney transplantation into human bodies to be performed in an emergency, and there is no alternative treatment and other halal organs available. Allowing a patient to perform pig organ transplants could be one of the efforts in carrying out hifdz al-nafs, which prioritizes life and self-preservation. After all, saving a human life is viewed as a noble gesture in Islam.

REFERENCES

- A. M. Mulkhan on Muladno and Z. Abidin. (2004). *Rantai Sistematis Flora, Fauna, dan Manusia*. IAIN Sunan Kalijaga.
- Abidin, Z. (2020). *Fiqh Ibadah* (1st ed.). Deepublish.
- Abuddin Nata. (2014). *Masa'il Al-Fiqhiyah*. Kencana Prenada Media Grup.
- Ahmed, S. T., & Dubey, V. (2019). *Section : Surgery Xenotransplantation*. 6(2), 10–14.
- al-Husain bin Muḥammad al-Raghib Al-Ashfahānī. (1412). *al-Mufradāt fī Gharīb al-Qur'an*. Dār al-Qalam.
- Al-Kady, B. (2021). Egyptian clerics denounce first pig kidney transplant into human body - Al-Monitor: The Pulse of the Middle East. *Al-Monitor*.
- Al-Shinawi, R. (2022). *Islamic teaching tells us animal organ transplants to humans are permissible*.

-
- Al-Suyuti, J. al-D. (2002). *Lubāb al-Nuqūl fī Asbāb al-Nuzūl*. Muassasah al-Kutub al-Thaqāfah.
- Ali bin Ismail Ibn Sidah. (2000). *al-Muhkam wa al-Muhid al-A'zam*. Dār al-Kutb al-Ilmiyah.
- Ali, M. (2016). Konsep Makanan Halal Dalam Tinjauan Syariah Dan Tanggung Jawab Produk Atas Produsen Industri Halal. : 291–306. *Ahkan Ilmu Syari'ah*, 16(1), 291–306.
- Ali, Mansur. (2019). Our Bodies Belong to God , So What ? God' s Ownership vs . Human Rights in the Muslim Organ Transplantation Debate. *Journal of Arabic and Islamic Studies*, 19, 57–80.
- Cooper, David K. C., Burcin Ekser, and A. J. T. (2015). A brief history of clinical xenotransplantation. *International Journal of Surgery*, 23(2), 205–210.
- Cooper, David K. C., Burcin Ekser, dan A. J. T. (2015). Immunobiological Barriers to Xenotransplantation. *International Journal of Surgery*, 23(1), 211–216.
- David K.C. Cooper and Robert P. Lanza. (2000). *Xeno: The Promise of Transplanting Animal Organs into Humans*. Oxford University Press.
- Fakhr al-Dīn al-Rāzi. (1981). *Mafātiḥ al-Ghayb, Vol 3*. Dār al-Fikr.
- Fuqaha, A. (2004). *Solusi Problematika Aktual Hukum Islam, Keputusan Mukhtamar, Munas dan Konbes Nahdhatul Ulama 1926-1999*. LTN NU Jawa Timur dan Diantama.
- Gulyaev, V. A., Khubutiya, M. S., Novruzbekov, M. S., Mironov, A. S., Olisov, O. D., Lutsyk, K. N., Zhuravel, S. V., Magomedov, K. M., Akhmetshin, R. B., & Yaremin, B. I. (2019). Xenotransplantation: History, problems and development prospects. *Transplantologiya*, 11(1), 37–54. <https://doi.org/10.23873/2074-0506-2019-11-1-37-54>
- Hasan, S. (2021). *Are Muslims ready to accept pig organ transplants?*
- Hornby, A. S. (2000). *Oxford Advanced Learner's Dictionary of Current English*. Oxford University Press.
- Ingrid Ingka Prameswari. (2015). *Pemanfaatan Organ Tubuh Manusia Wasiat Berdasarkan Hukum Islam*. Universitas Brawijaya.
- Iwase, H., & Kobayashi, T. (2015). Current status of pig kidney xenotransplantation. *International Journal of Surgery*, 23, 229–233. <https://doi.org/10.1016/j.ijssu.2015.07.721>
- Kutbuddin Aibak. (2009). *Kajian Fiqh Kontemporer Teras*. Teras.
- Lia Laquna Jamali. (2019). Transplantasi Organ Tubuh Manusia Perspektif al-Qur'an. *Diya Al-Afkar: Jurnal Studi Al-Quran Dan Al-Hadis*, 07(01).
- Lintang, R. (2013). Aspek hukum terhadap pemanfaatan organ tubuh manusia untuk kelangsungan hidup. *Lex et Societatis*, 1(5), 132–143.
- Lopp, L. (2013). *Regulations Regarding Living Organ Donation - Possibilities of Harmonisation*. Springer.
- Mansour, T. (2021). Egypt's Azhar issues fatwa allowing pigs' kidneys to be transplanted to humans. *The New Arab*.
- MM. Hussaini, A. S. (1983). *Islamic Dietary Laws and Practices, Islamic Food and Nutrition Council of America*.
- Mohammed Abdel, Y., & Tarshany, R. (2016). Protection Of Life In Islamic Law. *International Journal of Business, Economics and Law*, 9(5), 45–51.
- Muḥammad Rashīd Riḍā. (1990). *Tafsīr al-Mannār, Vol. 2*. al-Hay'ah al-Miṣriyah al-'Ammah li al-Kitāb.
- Muladno and Zainal Abidin. (2004). *Memaniakan Babi, Transplantasi Organ Babi Pada Manusia, Bagaimana Umat Islam Menyikapi*. Britz Publisher.
- Nurmansyah, I. (2020). Dialektika Tafsir Dan Kemajuan Pengetahuan Dalam Transplantasi Organ Babi Pada Manusia. *Jurnal Studi Ilmu-Ilmu Al-Qur'an Dan Hadis*, 21(1), 1. <https://doi.org/10.14421/qh.2020.2101-01>
- Pierson, R. N. (2020). Progress Toward Cardiac Xenotransplantation. *Circulation*, 142(14).
- R. Sjamshidajat, & W. de J. (2005). *Buku Ajar Ilmu Bedah (2nd Editio)*. Penerbit Buku Kedokteran EGC.

- Rohmah, L. (2018). Kontekstualisasi Hadis Tentang Transplantasi. *Hikmah Journal of Islamic Studies*, 14(2).
- Saifullah. (2016). TRANSPLANTASI ORGAN TUBUH (Perspektif Hukum Islam, Hukum Positif Dan Etika Kedokteran). " *Al-Mursalah: Jurnal Hukum Islam*, 2(1).
- Sarfraz, H. (2022). *An Islamic perspective on xenotransplantation*.
- Sari, M. (2020). Transplantasi Organ dalam Al-Quran Perspektif Tafsir Al- Maqasidi. *Substantia: Jurnal Ilmu-Ilmu Ushuluddin*, 22(1), 61. <https://doi.org/10.22373/substantia.v22i1.6758>
- Shalih Bin Fauzan bin Abdullah Al-fauzan. (2011). *Fiqih Makanan, translated by Abu Muawiyah Hammad, Mustolah Maufur*. Griya Ilmu.
- Sri Ratna Suminar. (2010). Aspek Hukum dan Fiqih tentang Transaksi Organ Tubuh Untuk Transplantasi Organ Tubuh Manusia. *Syar Hukum: Jurnal Ilmu Hukum*, 12(1).
- Veatch, R. M. and L. F. R. (2015). *Transplantation Ethics* (Second Edi). DC: Georgetown University Press.
- Yamada, H. (2022). Xenotransplantation of neonatal porcine bone marrow-derived mesenchymal stem cells improves diabetic wound healing by promoting angiogenesis and lymphangiogenesis. *Xenotransplantation*, 29(2).
- Zeyland, J., D. Lipiński, dan R. S. (2015). The Current State of Xenotransplantation. *Journal Applied Genetics*, 56(1), 211-218.
- Zulaekah, K. (2005). Halal dan Haram Makanan dalam Islam. *Suhuf*, 17(1), 24-37.

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