

TECHNIQUE OF CLAVICULA RADIOGRAPHY EXAMINATION IN CASES OF SINISTRA CLAVICULA FRACTURE IN RADIOLOGY INSTALLATION OF EFARINA ETAHAM BERASTAGI HOSPITAL KARO DISTRICT 2020

Firdasari¹, Arnaud Costinot², Ibnu Fajar³, Yunardi⁴, Sri Wahyuni Tarigan⁵,
(Universitas Efarina ^{1,3,4,5})

(Massachusetts Institute of Technology, Cambridge, Massachusetts, United States of America²)

*Correspondence: firdasari18@gmail.com

Abstract

The clavicle or collarbone is a long bone that serves as a support between the scapula and the sternum (breastbone). There are two Clavicula, namely the right and left. The clavicle is the only long bone in the body that is positioned horizontally. Together with the shoulder blades, it makes up the shoulder girdle. These are bones that are commonly touched, and in people who have less fat in this area, their location is very obvious, as they give rise to bumps in the skin. He received it from the Latin "Clavicula" which means little key, because the bone rotates along its axis like a key. The clavicle is the most commonly fractured bone. The bone can easily be broken by an impact to the shoulder from the force of a fall with an outstretched arm or a direct blow.

Keywords: • AP projection, Clavicula, Intensifying screen, Radiographic Cassette.

INTRODUCTION

According to the Bujang Doctor, 2012 The clavicle or collarbone is the foundation for the weight of the hands, so if there is an excess load it will cause an excess load on the Clavicula bone, this can cause a break in the continuity of the bone (fracture).

The clavicles or collarbones are the protruding bones on both sides of the front of the shoulders and above the chest. In human anatomy, the collarbone (clavicle) is the bone that forms the shoulder and connects the upper arm to the rest of the body, and provides protection to the important parts that underlie blood vessels and nerves.

Clavicle fractures account for 5% of all fractures so they are not uncommon. Clavicle fractures are also common injuries in sports such as martial arts, horseback riding and motor racing through both direct and indirect mechanisms. It does not rule out the possibility of a Clavicula fracture that occurs accompanied by other trauma, because it is located close to the neck. Every incident of Clavicula Fracture should be done cervical examination as well. Clavicula fractures are usually closed, depending on the mechanism of occurrence (Doctorbujang, 2012).

Research purposes

1. To find out how radiological examinations are carried out in cases of Clavicula fractures at the Radiology Installation at Efarina Etaham Berastagi University, Karo Regency 2020.
2. To find out how to get optimal image results

LITERATURE REVIEWS

Meaning of inspection

Radiology is a medical science that uses x-rays, gamma rays, beta rays, and other ionizing radiation which play an important role in diagnosing disease. (Ballinger, 2005)

Clavicula radiography is a radiographic examination process using x-rays. Clavicula radiographic examination using the kV technique in the range of 40 kV – 125 kV, at this kV capacity a high-resolution image will be obtained on the film, where the image of the fractured bone can be seen very clearly.

Physiology

The clavicle is a long bone that has a body and two ends. The lateral end is called the acromial extremity, which is jointed by the acromion process and scapula. The medial end is called the extremity of the sterna which makes a joint with the sternum (Bontrager, 2001).

Pathology

Pathological abnormalities can be plasmacytoma, osteosarcoma, Ewing sarcoma, multiple myeloma, and various primary malignant cancers (such as Langerhans cell histiocytosis). Cancerous metastases can also cause point lesions that develop into fractures in light trauma.

Etiology

Clavicula fracture etiology is trauma either directly or indirectly. Trauma can occur from a fall or all traffic accident with the side of the shoulder directly hitting a hard object. Another etiology that can cause clavicle fractures is a fall on an outstretched hand.

Anatomy

The clavicle or collarbone is the bone that forms the front of the cingulum superiosis. The clavicle includes an "S"-shaped long bone and is located horizontally next to the Cranioventral Cavum Thoracalis, above the Costa I. On the medial side it is jointed with the manubrium sterni, while on the lateral side it is jointed with the acromion. The part that is rounded and convex to the front is called the Sternal Extremity, while the part that is concave dorsally and flattened is called the Acromialis Extremity.

X-ray Aircraft Engineering

X-ray machine is an equipment that can produce x-rays. This tool in the medical field is used as a tool to diagnose and treat a disease.

Examination of the Clavicula with a Left Clavicula Fracture was carried out using a mobile x-ray unit

- Aircraft type : Mobile art Evolution Shimaddzu
- Aircraft brand: Siemens
- Number of Tubes: 1 piece

- Aircraft Capacity : 200 mA, 150 kV
- Aircraft Services: Radiography
- Input Voltage : 110 V-125 kV
- kV Range : 40 kV-125 kV
- Exposure time : 0.04 s-5 s

X-ray machine components consist of:

X-ray tube

An x-ray tube or x-ray tube is a vacuum made of heat-resistant glass which is where x-rays are produced. The x-ray tube is the main component in an x-ray machine.

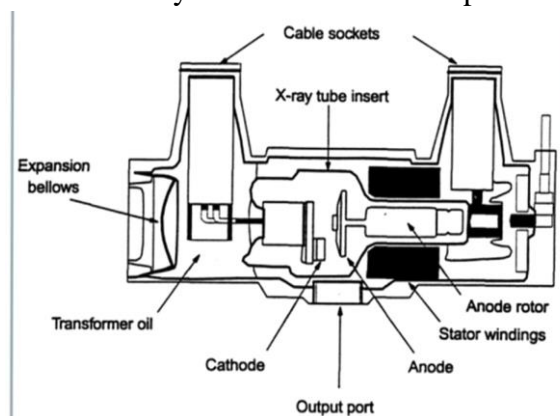


Image: x-ray tube

Information :

- Cathode / negative electrode (source of electrons)
- Positive anode/electrode (acceleration potential)
- Focusing cup (electron guide)
- Rotor or stator (target device) or anode player
- Glass metal envelope (vacuum tube) or vacuum
- Oil or coolant x-ray tube
- Window (where x-rays come out)

Radiodiagnostic Physics

Radiodiagnostic Physics comes from two words of physics, namely physics and radiodiagnostics. Physics is the study of the symptoms of the interaction of objects (matter). Radiodiagnostics is the use of radiation for diagnostic purposes.

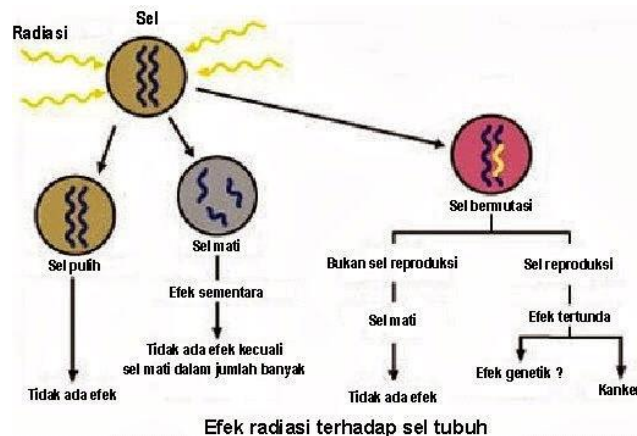
Radiodiagnostic Physics is the study of symptoms by using x-rays produced from X-ray tubes to make a diagnosis.

Radiation Protection

Radiation protection is the protection of people from the harmful effects of exposure to ionizing radiation and how to achieve them. Radiation protection is control

over radiation hazards through regulations relating to the use of radiation and radioactive materials.

Radiation protection is the protection of society and the environment from the harmful effects of ionizing radiation, which includes high energy particle radiation and electromagnetic radiation



The interaction of radiation with biological materials begins with physical interaction, namely the process of excitation and/or ionization, which occurs within 10-15 seconds after radiation exposure. This reaction within 10-15 seconds is immediately followed by physicochemical interactions resulting in the formation of radical ions. Furthermore, a chemical reaction occurs by producing free radicals within 10-5 seconds. Free radicals induce biochemical reactions that cause damage, especially to DNA. This series of processes ends with the occurrence of a biological response which within days to years will cause a biological effect.

Radiological Examination

Even though the appearance and severity of the fracture can be seen from the clinical symptoms that appear, radiological examinations still need to document the extent and extent of the fracture and identify the possibility of other bone injuries. Evaluation of acutely injured patients is generally sufficient using conventional radiography. , other imaging that is a level above conventional is said to have an important role as well.

METHODS

Types of research

This type of research is qualitative data research. According to Hidayat, 2007 Qualitative data research is a research method that is carried out by collecting data by viewing or analyzing documents in a hospital. The main goal is to conclude about a situation objectively. (Hidayat, 2007)

Research sites

The location of this research was carried out at the Radiology Installation of Efarina Etaham Berastagi Hospital, Karo Regency in 2020

Research time

Time of research and data collection of the Os Clavicula case with a suspected Left Clavicle Fracture at the Efarina Etaham Berastagi Hospital Installation, Karo Regency in 2020

Data Checking Techniques

The data checking technique is Secondary Data. The method used in writing scientific papers uses a qualitative method, while the approach used is a case with a technique (Hidayat, 2007)

1. 1). Observation and physical examination by direct observation of the client on matters relating to the client's problems.
2. 2). Documentation studies are carried out by seeking sources of information obtained from the patient's status and matters relating to the patient's problems. Literature study, namely by studying books, papers and other sources to obtain scientific bases related to the Clavicula with suspected Clavicula Fractures left so that it can compare between theory and implementation in cases in hospitals. In this study, the study observed the implementation of radiography of the os Clavicula starting from the initial examination of the os Clavicula with cases of fracture of the left Clavicula until it was finished.

Research schedule

NO	Activity	June	July	August	September	October
1.	Proposal Making					
2.	Proposal Seminars					
3.	Proposal Improvements					
4.	Data collection					
5.	Writing KTI					
6.	KTI Exam					

RESULTS AND DISCUSSION

Contents Results and Discussion

Overview of Research Locations

Radiology Installation at Efarina Etaham Hospital, Berastagi, Karo

Research result

Male Patient Identity

Name : ADAL TALMON
Address : Berastagi
Age : 35 years old
Examination Date : August 7, 2020
Inbound Diagnostics : Fracture of the lateral 1/3 of the left clavicle

Patient History

The patient was a victim of a motorcycle traffic accident on August 7 2020 at approximately 13.40 WIT. The victim was immediately rushed to the Efarina Etaham Berastagi Hospital Emergency Room, and then taken to the radiology room to take an X-ray of the Clavicula

Examination Procedure

1. Tools preparation
2. X-ray plane
3. Brand name: Siemens
4. No. Tube Series :-
5. maximum kV : 65
6. maximum mA : 160
7. seconds : 0.6
8. tube type: single
9. Cassette and Film size 24 x 30
10. Marker : L
11. Patient preparation

In the left clavicle examination technique, the patient is only asked to remove his upper clothes because it can interfere with the radiographic picture

- inspection technique

The technique for examining the left clavicle at Efarina Etaham Berastagi Hospital is for the patient to stand facing the light.

Patient position: the patient stands facing the beam and the cassette measuring 24 x 30 cm is placed on the bucky stand.

Object position: try to attach the left collarbone to be photographed against the bucky stand and face the light

Direction of beam: vertical perpendicular to the aiming point right at the angle of the scapula

Marker : L

FFD : 100cm

kV : 65

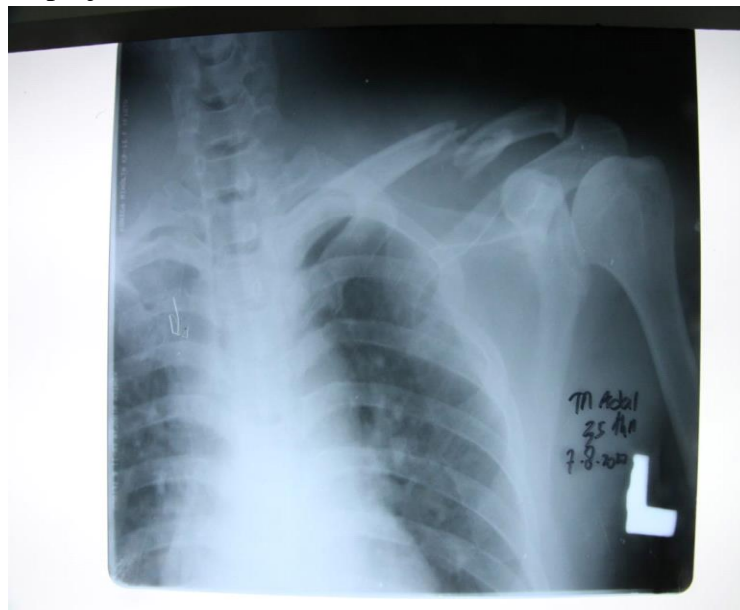
mA : 160

S : 0.6

- Film processing carried out by Rsdiology at Efarina Berastagi Hospital is an automatic processing unit

Contents of Discussion Results

Based on the radiographs that have been obtained regarding the examination of the left Clavicula fracture at the Radiology Installation of Efarina Etaham Berastagi Hospital, it is generally used the Posterior Antero (PA) projection because this projection already reveals abnormalities that suspect in the case of Left Clavicle Fracture, besides that with this projection the patient feels more comfortable and safe so that the fracture experienced does not get worse. According to the author, when viewed in theory, the more profitable projection is the PA projection because it does not interfere with other diseased parts of the body. And another advantage is that the patient can also see the photos directly after the film has been washed. However, there are also disadvantages for the patient. in this case. When performing this projection,





CLOSING

Conclusion

After carrying out a radiographic examination of the fracture of the left clavicle at Efarina Etaham Berastagi Hospital, Karo Regency, the authors draw the following conclusions.

1. On radiography of the fracture of the left clavicle, detail with sharpness is needed.
2. It is very important to note the wide use of the irradiation field, so that the object to be seen is in the center of the film.
3. Lighting conditions affect the size of the object to be photographed.
4. In terms of protection, protection against radiation is very important to note, so that the dose received by patients, personnel, and the surrounding community is as small as possible, so as to avoid the dangers of radiation.
5. The process of washing the film also affects the high or low shooting conditions.

Suggestions and Acknowledgments

To improve the quality of radiographic images the authors can provide the following suggestions:

1. For examination of the clavicle, it is best to pay attention to the position of the patient right on the bucky stand so that the photos are right in the middle of the film and not too overpositioned to the left or right.
2. Radiography must be more careful in determining the area of the irradiation field with the size of the object to be photographed.
3. We recommend that the film washing in the automatic processing unit be adjusted between the storage conditions and the temperature and age of the liquid, especially the developer

REFERENCES

- Slone, Ethel (2003), *Anatomy and Physiology for beginners/linguists*, James Veldman; Indonesian editor, Palupi Widyastuti__Jakarta: EGC,
- Price, Sylvia Andreson (2005), *Pathophysiology: Clinical Concepts of Disease Processes Vol.I__Jakarta: EGC,*
- Kahle,(1997), *Pelvic Bone Anatomy*,<https://www.google.com/search?q=anatomy+bone+pelvis>
- Noor, Zairin (2016), *Textbook of Musculoskeletal Disorders-Jakarta: Salemba Medika, 2016*
- Utami Puji Asih, Saputra Dwi Sudiby, Felayani Fadli (2014), *Basic Radiology I, Anatomy of Radiology and Pathophysiology*, Publisher: Inti Medika Pustaka,
- Bontrager (2001), *Pelvic Radiographic Examination Techniques*, Issue 5, 2001
- Price, Sylvia Andreson (2005), *Pathophysiology: Clinical Concepts of Disease Processes Vol.II__Jakarta: EGC,*
- Rasad, Syahriar (2005), *Diagnostic Radiology*, Jakarta: FKUI.
- Clark's, KC (2005), *Positioning In Radiography*, London : Infrord Limited.
- Nur Ilham, R. ., Arliansyah, A., Juanda, R., Multazam, M. ., & Saifanur, A. . (2021). RELATHIONSIP BETWEEN MONEY VELOCITY AND INFLATION TO INCREASING STOCK INVESTMENT RETURN: EFFECTIVE STRATEGIC BY JAKARTA AUTOMATED TRADING SYSTEM NEXT GENERATION (JATSENG) PLATFORM. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAAS)*, 1(1), 87–92.<https://doi.org/10.54443/ijeabas.v1i1.27>
- Yusuf Iis, E., Wahyuddin, W., Thoyib, A., Nur Ilham, R., & Sinta, I. (2022). THE EFFECT OF CAREER DEVELOPMENT AND WORK ENVIRONMENT ON EMPLOYEE PERFORMANCE WITH WORK MOTIVATION AS INTERVENING VARIABLE AT THE OFFICE OF AGRICULTURE AND LIVESTOCK IN ACEH. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAAS)*, 2(2), 227–236.<https://doi.org/10.54443/ijeabas.v2i2.191>
- Geovani, I. ., Nurkhotijah, S. ., Kurniawan, H. ., Milanie, F., & Nur Ilham, R. . (2021). JURIDICAL ANALYSIS OF VICTIMS OF THE ECONOMIC EXPLOITATION OF CHILDREN UNDER THE AGE TO REALIZE LEGAL PROTECTION FROM HUMAN RIGHTS ASPECTS: RESEARCH STUDY AT THE OFFICE OF SOCIAL AND COMMUNITY EMPOWERMENT IN BATAM CITY. *International*

- Journal of Educational Review, Law And Social Sciences (IJERLAS), 1(1), 45–52. <https://doi.org/10.54443/ijerlas.v1i1.10>
- Bustani, B., Khaddafi, M. ., & Nur Ilham, R. (2022). REGIONAL FINANCIAL MANAGEMENT SYSTEM OF REGENCY/CITY REGIONAL ORIGINAL INCOME IN ACEH PROVINCE PERIOD YEAR 2016-2020. International Journal of Educational Review, Law And Social Sciences (IJERLAS), 2(3), 459–468. <https://doi.org/10.54443/ijerlas.v2i3.277>
- Nur Ilham, R., Heikal, M. ., Khaddafi, M. ., F, F., Ichsan, I., F, F., Abbas, D. ., Fauzul Hakim Hasibuan, A. ., Munandar, M. ., & Chalirafi, C. (2021). Survey of Leading Commodities Of Aceh Province As Academic Effort To Join And Build The Country. IRPITAGE JOURNAL, 1(1), 13–18. <https://doi.org/10.54443/irpitage.v1i1.19>
- Nur Ilham, R., Likdanawati, L., Hamdiah, H., Adnan, A., & Sinta, I. . (2022). COMMUNITY SERVICE ACTIVITIES “SOCIALIZATION AVOID STUDY INVESTMENT” TO THE STUDENT BOND OF SERDANG BEDAGAI. IRPITAGE JOURNAL, 2(2), 61–64. <https://doi.org/10.54443/irpitage.v2i2.312>
- Falahuddin, F., Fuadi, . F., Munandar, M., Juanda, R. ., & Nur Ilham, R. . (2022). INCREASING BUSINESS SUPPORTING CAPACITY IN MSMES BUSINESS GROUP TEMPE BUNGONG NANGGROE KERUPUK IN SYAMTALIRA ARON DISTRICT, UTARA ACEH REGENCY. IRPITAGE JOURNAL, 2(2), 65–68. <https://doi.org/10.54443/irpitage.v2i2.313>
- Majied Sumatrani Saragih, M. ., Hikmah Saragih, U. ., & Nur Ilham, R. . (2021). RELATIONSHIP BETWEEN MOTIVATION AND EXTRINSIC MOTIVATION TO ICREASING ENTREPRENEURSHIP IMPLEMENTATION FROM SPP AL-FALAH GROUP AT BLOK 10 VILLAGE DOLOK MASIHUL. MORFAI JOURNAL, 1(1), 1–12. <https://doi.org/10.54443/morai.v1i1.11>
- Sandi, H. ., Afni Yunita, N. ., Heikal, M. ., Nur Ilham, R. ., & Sinta, I. . (2021). RELATIONSHIP BETWEEN BUDGET PARTICIPATION, JOB CHARACTERISTICS, EMOTIONAL INTELLIGENCE AND WORK MOTIVATION AS MEDIATOR VARIABLES TO STRENGTHENING USER POWER PERFORMANCE: AN EMPERICAL EVIDENCE FROM INDONESIA GOVERNMENT. MORFAI JOURNAL, 1(1), 36–48. <https://doi.org/10.54443/morai.v1i1.14>
- Sinurat, M. ., Heikal, M. ., Simanjuntak, A. ., Siahaan, R. ., & Nur Ilham, R. . (2021). PRODUCT QUALITY ON CONSUMER PURCHASE INTEREST WITH CUSTOMER SATISFACTION AS A VARIABLE INTERVENING IN BLACK ONLINE STORE HIGH CLICK MARKET: Case Study on Customers of the Tebing Tinggi Black Market Online Store. MORFAI JOURNAL, 1(1), 13–21. <https://doi.org/10.54443/morai.v1i1.12>
- Ilham, Rico Nur. et all (2019). Investigation of the Bitcoin Effects on the Country Revenues via Virtual Tax Transactions for Purchasing Management. International Journal of Supply Management. Volume 8 No. 6 December 2019.
- Ilham, Rico Nur. et all (2019).. Comparative of the Supply Chain and Block Chains to Increase the Country Revenues via Virtual Tax Transactions and Replacing Futures of Money. International Journal of Supply Management. Volume 8 No. 5 August 2019.
- Lasta Irawan, A. ., Briggs, D. ., Muhammad Azami, T. ., & Nurfaliza, N. (2021). THE EFFECT OF POSITION PROMOTION ON EMPLOYEE SATISFACTION WITH

- COMPENSATION AS INTERVENING VARIABLES: (Case Study on Harvesting Employees of PT. Karya Hevea Indonesia). *International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)*, 1(1), 11–20. <https://doi.org/10.54443/ijset.v1i1.2>
- Rahmaniar, R., Subhan, S., Saharuddin, S., Nur Ilham, R. ., & Anwar, K. . (2022). THE INFLUENCE OF ENTREPRENEURSHIP ASPECTS ON THE SUCCESS OF THE CHIPS INDUSTRY IN MATANG GLUMPANG DUA AND PANTON PUMP. *International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)*, 1(7), 337–348. <https://doi.org/10.54443/ijset.v1i7.36>
- likdanawati, likdanawati, Yanita, Y., Hamdiah, H., Nur Ilham, R., & Sinta, I. (2022). EFFECT OF ORGANIZATIONAL COMMITMENT, WORK MOTIVATION AND LEADERSHIP STYLE ON EMPLOYEE PERFORMANCE OF PT. ACEH DISTRIBUS INDO RAYA. *International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET)*, 1(8), 377–382. <https://doi.org/10.54443/ijset.v1i8.41>
- Nur Ilham, R., Arliansyah, A., Juanda, R. ., Sinta, I. ., Multazam, M. ., & Syahputri, L. . (2022). APPLICATION OF GOOD CORPORATE GOVERNANCE PRINCIPLES IN IMPROVING BENEFITS OF STATE-OWNED ENTERPRISES (An Emperical Evidence from Indonesian Stock Exchange at the Moment of Covid-19). *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAAS)*, 2(5), 761–772. <https://doi.org/10.54443/ijeabas.v2i5.410>
- Rico Nur Ilham, Irada Sinta, & Mangasi Sinurat. (2022). THE EFFECT OF TECHNICAL ANALYSIS ON CRYPTOCURRENCY INVESTMENT RETURNS WITH THE 5 (FIVE) HIGHEST MARKET CAPITALIZATIONS IN INDONESIA. *Journal of Economics*, 11(02), 1022–1035. Retrieved from <http://ejournal.seaninstitute.or.id/index.php/Ekonomi/article/view/481>
- Nur Ilham, R., Likdanawati, L., Hamdiah, H., Adnan, A., & Sinta, I. . (2022). COMMUNITY SERVICE ACTIVITIES “SOCIALIZATION AVOID STUDY INVESTMENT” TO THE STUDENT BOND OF SERDANG BEDAGAI. *IRPITAGE JOURNAL*, 2(2), 61–64. <https://doi.org/10.54443/irpitage.v2i2.312>
- Wayan Mertha, I. ., & Mahfud, M. (2022). LEARNING HISTORY BASED ON WORDWALL APPLICATIONS TO IMPROVE STUDENT LEARNING RESULTS CLASS X IPS IN MA AS'ADIYAH KETAPANG. *International Journal of Educational Review, Law And Social Sciences (IJERLAS)*, 2(5), 507–612. <https://doi.org/10.54443/ijerlas.v2i5.369>
- Mahfud, M., Yudiana, IK, & Sariyanto, S. (2022). HISTORY OF BANYUWANGI KALIKLATAK PLANTATION AND ITS IMPACT ON SURROUNDING COMMUNITIES. *International Journal of Educational Review, Law And Social Sciences (IJERLAS)*, 3(1), 91–104. <https://doi.org/10.54443/ijerlas.v3i1.492>
- Mahfud et all (2021). UTILIZING THE USING LAWON RESIDENTIAL TRADITION AS A SOURCE OF LEARNING LOCAL HISTORY IN HIGH SCHOOLS IN BANYUWANGI. *Scientific Development Media Vol.16 No.3 October 2021*. <http://ejurnal.binawakya.or.id/index.php/MBI/article/view/1294/pdf>
- Sinta, I., Nur Ilham, R. ., Authar ND, M. ., M. Subhan, & Amru Usman. (2022). UTILIZATION OF DIGITAL MEDIA IN MARKETING GAYO ARABICA

COFFEE. IRPITAGE JOURNAL, 2(3), 103–
108.<https://doi.org/10.54443/irpitage.v2i3.467>

Nur Ilham, R., Arliansyah, A., Juanda, R. ., Sinta, I. ., Multazam, M. ., & Syahputri, L. .
(2022). APPLICATION OF GOOD CORPORATE GOVERNANCE PRINCIPLES
IN IMPROVING BENEFITS OF STATE-OWNED ENTERPRISES (An Emperical
Evidence from Indonesian Stock Exchange at the Moment of Covid-19).
International Journal of Economic, Business, Accounting, Agriculture Management
and Sharia Administration (IJBAS), 2(5), 761–
772.<https://doi.org/10.54443/ijebas.v2i5.410>

Mahfud et all (2020). Developing a Problem-Based Learning Model through E-Learning
for Historical Subjects to Enhance Students Learning Outcomes at SMA Negeri 1
Rogojampi. IOP Conf. Series: Earth and Environmental Science 485 (2020) 012014
doi:10.1088/1755-1315/485/1/012014